

Bleasdale
Computer Systems Ltd
XENIX™
is now available on the
Bleasdale 600 micro
Tel 01-828 6661
XENIX is a trademark of Microsoft

Computer Weekly

Thursday, March 4, 1982

'82. A great
year
for PTZ.
PTZ
THE ADVANCED
FEATURE
TERMINAL FOR
ICL AND IBM.
FERRANTI
Computer Systems

**DATA
PREPARATION**
We have the capacity to
prepare your data in the
format you need for
your IBM mainframe
or other computer.
Peter Merrick
ASSOCIATES
Phone 01-688 8047 Croydon

Computer Weekly
Thursday, March 11, 1982 Number 799 30p

NEWBRAIN
FROM
Small Business
SOME
TEDDINGTON, WIRE
TW11 8TD
Registered Office
Tel: 01-977 1171/8
Telex: 929728

Sixty UK IBM programmers join brain drain

by Philip Hunter
THE fast-growing market in the US for UK contract staff has brought 60 appointments for IBM programmers and analysts in Kentucky.
The British team will leave during the next few months to implement a large life insurance project, following a deal signed in the New Year between the London-based VLI Group of contract agencies and US insurance conglomerate Capital Holdings (CHC).
Interviews for the 60 vacancies are now being conducted in London by six CHC technical staff from a pool of applicants from VLI's reservoir of 12,000 contractors and from recent advertisements.
"This is the biggest US contracting coup I know," says VLI marketing director Anthony Lambic. There are at present only about 400 UK contractors working in the whole US, he says.
The project with CHC is expected to last 18 months and could provide over £2 million revenue for VLI. It involves modifying an IBM-based insurance system for another US company, Informatics.
"We are therefore looking mainly for Cobol and IBM Assembler people," says Jim Hayes, CHC's head of Information Systems and Services.
The minimum requirement is for people with between two and five years' experience, who will earn around \$25,000 in the first year. "There are plenty of people at home in the US with less than two years' experience," comments Hayes.
More experienced contractors can expect to make \$40,000 a year, while people with 15 years' experience in IBM operations, with CICS to boot, may top \$50,000.
For UK contractors to get work permits in the US, it has to be shown that there is difficulty in finding the right people locally. With 100,000 more jobs than people in the US computer industry, this was not a problem.
Hayes is confident the vacancies will be filled from VLI's pool of contractors.



AMERICA... attracting growing numbers of contract computer workers.

Tax changes will test software suppliers

by Cliff Dillaway
IMMINENT changes in the method of calculating PAYE will soon test the abilities of numerous small software houses which have been formed in recent years to supply software packages to microcomputer users.
The last significant changes in the tax formula took place in 1973. Since then, small computers for payroll programs have been installed on a large scale.
While the changes in themselves are not particularly complex, they will necessitate a reworking of existing payroll programs. That raises the logistical problem of distributing copies of the new programs to users.
Date for implementation has not been announced, but it is expected to be co-ordinated with any changes in tax rates or bands that may result from the budget on March 9.
Much microcomputer software is sold through dealers, and according to David Lowe, managing director of ACT Microsoft, distribution is to a large extent dependent on how good, or bad the dealer is in terms of keeping lists of customers. But Lowe adds that he does not think there will be a problem, particularly if enough time is given to make the changes.
The Inland Revenue has consulted the Payroll Policy Committee of the British Computer Society, which requested sufficient lead time before the new formula becomes effective. Mini- and microcomputer payroll package suppliers are not, however, heavily represented on the policy committee, and BCS would welcome more involvement to ensure the changes are made smoothly.
The changes in the payroll calculation are contained in an Inland Revenue publication, Notes at PAYE for Computer Users, series six, number 11. The first change reflects a modification to the size of the table used to arrive at free pay in manual tax calculations, and will probably only necessitate the alteration of a constant in the computer program.
The second change involves rounding of tax free pay, which has been rounded upwards to the nearest five pence. It will now be rounded up to a penny. This change too will probably only affect constants, rather than the logic of the program.
It is usual at Budget time to see a change in tax rates and bands, but these affect a reserved section of a program which can be modified by means of overlays. Changes in the formula for calculation call for a different response, and it is the speed and smoothness of that response which microcomputer users will be looking to.

IBM prices up for third time in nine months

by Kevin Pearson
IBM EUROPE has announced its third package of price rises in nine months in the face of falling profitability on its overseas business. Last year the corporation lost \$400 million of profit due to the strength of the dollar on international exchanges.
Lease and rental charges for a broad range of IBM products in the UK went up by 8% from March 1. The exception was large mainframes, and the System 34 and System 38 small business systems. Maintenance charges are up by 5% in most cases and 10% on some items of equipment, and program product fees are up 5%.
IBM last increased its prices in October 1981, when prices on three-quarters of its licensed software went up by 15%. At the same time the maintenance charges on its 600 series machine went up 10%. Maintenance on the 303X series of mainframes rose by 15%. Only the top-end 3081 was exempt. The previous price rise was in June.
IBM attributes the latest rises to high rates of inflation and the level of interest repayments. The rise of the dollar last year cost it heavily, particularly on its lease/rental deals. The company has put the burden of the rises heavily on the 4300 series and its terminals and peripherals, from which it gets most of its rental revenue.
It has not increased the rental charges for the large systems, including the 3081, because most of these are sold outright. Given the relatively small number installed, price and rental charges have a small impact on total business. But the 4300 has been very successful, with over 1,000 systems in the UK according to some estimates.
The users of large systems do not escape entirely however. They will pay 5% more for both maintenance and licensed software on top of the rises announced in October.
The rise in the price of program products continues the recent trend in that direction. Since there is very little competition in the IBM system software market the company is increasing its prices in line with what the market will bear.
The software increases are particularly stark in light of last October's rises, and the change in pricing policy announced last November when the new top-end 3081K machine was introduced.
At that time IBM began to price some items of system software, like its Time Sharing Option, separately. Previously TSO was available as part of the MVS system control program.
The company announced at the same time that there would be installation charges for certain items of software. The cost of changing from a multiple 3033 system to several 3081s was then put at as much as \$1.5 million over two to three years in installation charges and migration aids. The latest rises add considerably to this.
The recent price cut in price of the System 34 in the US has increased speculation that IBM is preparing to drop the machine, ready for the launch of a System 38 based replacement. The company cut the price of top models in the System 34 range by about 10%. It also announced volume discounts of between 6 and 9% on all models of System 34 and System 38. IBM UK cut the price of System 34 by up to 21% in February, and the machine was exempted from the general round of price rises announced last week.
IBM balance sheet ticks - page 12.



ORROCK... "Clearing banks don't understand Middle East."

Quick sale saves software house

by Kevin Cahill
IN what must be one of the shortest resurrections on record, software house Computer Resources has been sold to US-based United Computing.
In brief interests have been hived off intact to system supplier Data Logic for an undisclosed price, but its international division has still to find a buyer.
Computer Resources went into receivership on Tuesday of last week under the combined strain of funding a huge Saudi Arabian contract and a very tight loan from the Industrial and Commercial Finance Corp.
But by Friday the receiver at Cork, Gully & Co, Michael Jordan, was able to announce the sale. He had been called in by Computer Resources' founder and chairman Ian Orrock to dispose of a company which had over £3.25 million in the year ended December 1980 with profits of over £250,000. The results for 1981 will see turnover of over £4 million but profits unchanged.
The company ran into trouble because of slow payments on a huge £2.6 million contract it won last April in Saudi Arabia. The contract calls for a 4341-based system to be developed for the Saudi Arabian General Presidency of Youth Welfare and has seen Computer Resources move into a new so-called Arabic data centre in Woking where Arab programmers have been hired to help write it.
There are doubts whether the contract is still viable. Computer Resources has already renegotiated with the Saudis at least once to retain the business and a £130,000 performance bond demanded by the Saudis has been called in.
The bond was the subject of a row between Orrock and the National Westminster Bank which was originally asked to put up the money. Orrock accused the clearing banks of "not understanding how one does business in the Middle East", and eventually put up the money from within the company.
Some 190 of the existing 200 staff have been offered jobs by the new owners.

NEWS BRIEF

Supermarket system trials next year

A MAJOR new supermarket point of sale system from ICL has been developed in conjunction with a consortium of European retailers, including Sainsbury's. Provisional orders have been placed, and deliveries will start at the end of the year to enable customer trials at the beginning of 1983.
An extension of the 9500 series, the system includes laser scanning.

Disagreement

THE new technology agreement between the civil service unions and the government seems set for rejection. Although the Council of Civil Service Unions will not vote until next week, the Society of Civil and Public Servants' Executive, the second largest civil service union, has already rejected the draft by a narrow margin. A two-thirds majority positively favouring acceptance is required.

DG launch

PREPARING the way for an April UK launch of its Enterprise 1000 desk-top 16-bit microcomputer, Data General has appointed Manchester-based Search Computers as a stock holding distributor. In the first year it is aiming to have about 20 dealers in the North of the UK. A distributor to cover the Southern half of the country will be appointed by Data General in a few weeks.

Fastest in West

THE fastest-growing data processing industry in the West is to be found in the Republic of Ireland, where growth has reached 35 per cent. From a small base the country has vigorously promoted itself for both manufacturing and services. Report page 22.

More relational promises

by Kevin Pearson
A SMALL London-based microcomputer dealer and consultancy is about to launch a system which it claims could revolutionise the way microcomputers are used.
Electronic Office Services plans to launch a relational type database system which it says will cut software development time by as much as 75% and reduce costs by up to 50%.
The database will be sold as part of a package including application software for the new generation of 16-bit micros, like Chuck Peddle's Sirius and IBM's Personal Computer.
The system is based on Micro Data Base Systems (MDBS) 3 database with applications software developed by Electronic Office Services.

Govt gives thinking on satellite broadcasting

by David Greaver
HOW soon individuals in the UK will be able to use computer terminals to bank and shop from home could be determined by an announcement in the Commons today by William Whitelaw, Home Secretary.
Government intentions for satellite broadcasting and a national cable television network are expected to be clarified, and a flood of investment could hinge on Whitelaw's willingness to release the Home Office's stranglehold on cable and satellite transmissions.
The Department of Industry and private industry have been pushing for an open market in cable distribution networks and satellite and radio links. References have been made to the US cable television network, which has shown tremendous expansion since its deregulation in the early 70s.
Technology Minister Kenneth Baker said in the Commons last week that opportunities for direct broadcasting by satellite and cable television were enormous in terms of investment and job creation.
He said that British Aerospace is making 10 space satellites at the moment and that the UK is in the preliminary stages of making what would be the largest and most powerful satellite of the 1980s.
Called L-Sat, the £230 million project was started in December of last year with British Aerospace as prime contractor.



WHITELAW... will he relax hold on satellite transmissions?

EEC to pursue IBM case

THE EEC case against IBM is to continue despite pressure from the US Government to drop the action.
Representatives from the US Commerce Department at an internal hearing in Brussels last week urged the Commission to abandon its case since similar charges levelled at IBM had resulted in IBM's acquittal.
The Commerce Department fears that any action against the company in Europe which did not apply in the US could be prejudicial to IBM's business.
The case will continue with a second hearing.

DIGICO COMPUTERS



the best of both worlds

Some say it's mine, some say it's IBM's, but DIGICO offers you the best of both.
The best of what? Well, mine is good for letters and data, and IBM's is good for spreadsheets and word processing. So we give you both, integrated by Digico.
Start with our Price/Performance computer and you'll find it's a real bargain. It's a 286 computer with 1MB RAM, 20MB hard disk, and a 3.5" floppy drive. It's a real bargain.
And if you want a more powerful computer, we have that too. It's a 386 computer with 2MB RAM, 40MB hard disk, and a 3.5" floppy drive. It's a real bargain.
All this and more, and you can have it all. Call us now and we'll show you how.

ICL moves to reshape more of its marketing strategies

Nexus buy slots in as 7700 replacement

by Boris Sodeack
ICL is to announce significant enhancements to its office automation products, which will include a new 2200 word processor and new models of its 7700 series information processor.
When ICL acquired the marketing rights to the Logica-manufactured Nexus 2200 from the British Technology Group, it was not clear how it would fit in with ICL's existing 7700 information processor, based on the ICL 7502 computer controller.
The 7502 is an ageing piece of equipment and it was rumoured that ICL would drop it to make way for the Nexus 2200. However, the 7502 is a synchronous communications device designed specifically to hook up with ICL machines using CO2 and CO3 protocols. These facilities are not available on the standard Nexus 2200.
The Nexus 2200 is essentially a standalone device with limited communications facilities whereas the 7700 provides integrated office automation facilities including data processing, word processing, database access and electronic mail from a number of terminals connected to it.
But ICL plans to bridge the gap when it announces networking facilities to ICL mainframes within a month's time on the Nexus 2200. This would effectively kill off the 7700 information processor. Plans to follow this up with the announcement of a new and enhanced 7700 which will use up-to-date technology are well advanced.

Software goes commercial

by Andrew Thomas
ICL's in-house DP department is set to market applications software developed for its own use. Corporate Information Systems (CIS) is now part of ICL's services group, with Baric and the remains of Dataflex, and for the first time it is being marketed commercially.
The department is also building a worldwide corporate network for repairs, orders and corporate reporting, which is planned to be active. The system is already in use for South Africa, Australia and most of Europe via dial-up links.
The system uses standard PTT networks, and it is ICL's intention to develop the network as the company moves into new territories.

IBM 3101
ASCH VDU
7x14 dot matrix
Green phosphor screen
Buffered printer interface
Character/block mode transmissions
EX-STOCK
RAIR 01-836 6921
6-9 Upper St. Martin's Lane London WC2H 9EQ

Computer financing
Standard House, 2, 4 Old Bond Street
London W1X 3JH
FOR SALE OR LEASE
£3,370.00
AVAILABLE MAY 1982
THIS IS A RARE OPPORTUNITY
TELEPHONE 01-491 4153 or 01-493 7955, TELEX 9954724

INSIDE THIS WEEK'S ISSUE
Premier silent on "secret databank" 2
Big Brother security system for UK 4
Real growth still eludes IBM 12
Ad to cut out the contract agency 16
Three-page graphics feature 19/21
Magnificent rescue plan 2
Drop case against IBM 2
Press Scharansky call 4
Brazil threat 7
Through £2m barrier 9
Software file 10
Micro News 11
Company News 12
GIB's Mythology 14
Downside by Chad 14
Letter 15
Programmer's Page 16
Foster 16
Op Sped 16
People/Direct 17
Product 24/25
Marketplace 26/27
Sales UK 27
Jobs: Page 28/47

DEC Users:
consider the alternatives
1 You get more reliability
2 You get faster delivery
3 You save more money
4 You get a lot more flexibility
5 You can save more floor space
6 You get better services and support
We're System Industries and we've become the world's largest supplier of high-performance DEC systems. Our compatible disc storage systems, our broad product line includes every DEC minicomputer you can name - including the "supermini" VAX 11/780 - and our alternatives.
System Industries
Woking (04862) 5077
System Industries (Europe),
System House, Guildford Road,
Woking, Surrey GU24 0JQ

ICL extends its clustered terminal range

by Philip Hunter
ICL has completed its series of intelligent terminal systems for local networking by introducing two new products aimed at users of its own mainframes. The first models of the series, known as the distributed resource system, DRS, were introduced last autumn to grab business from users of competitors' mainframes in local networking, and to replace the popular but ageing 1500 computer.

The Model 16 is similar to the Model 10 launched earlier and is housed in the same box, but is cheaper, costing £1,550 in the UK compared with about £2,200 for the Model 10.
Model 30 systems will cost from £3,800 for a basic configuration comprising a cluster controller, video workstation and matrix printer, to £40,000 for a large clustered system with 24 video workstations and eight printers.

A cluster of new DRS20 video terminals on test at ICL's Letchworth factory.

The earlier models in the DRS range were the 10, 40 and 50 based on the 8-bit Intel range for an attack on distributed resource processing in competitors' installations.

The Models 16 and 30 are controlled by new versions of the Distributed Resource Executive software, DRX, which provides screen and keyboard control, local validation, data editing and facilities for networking.

London campaign to free Soviet scientist

by Boris Sedacca
FIVE years have elapsed since the arrest of the 34-year-old Soviet computer scientist Anatoly Scharansky on a charge of treason and his subsequent imprisonment for espionage and anti-Soviet agitation.

The campaign for his release is gathering momentum and his case has been put forward as evidence of Soviet violations of human rights agreed at Helsinki, at a meeting currently taking place in Madrid, despite Soviet attempts to keep it off the agenda.
Now the London-based Women's Campaign for Soviet Jewry is planning to hold a demonstration on March 15 to mark the fifth anniversary of his arrest.

for military purposes.

Over the following four years he served over 12 prison sentences of 12 to 15 days, all without charges, and during this time he was dismissed from the Moscow Research Institute.

He became a founder member of the Committee for the Implementation of the Helsinki Agreement in Moscow which the Soviet authorities refused to recognise, and his command of English marked him as a spokesman for foreign journalists reporting on the Soviet activists.

Scharansky was arrested on March 15, 1977, and was held incommunicado for 16 months.

In May the KGB informed Scharansky's mother that he was to be charged with espionage. The lawyer appointed by Scharansky's mother to defend him was later expelled from the Soviet Union in an attempt by the KGB to appoint a State lawyer to the defence.

In August 1977, the US Association for Computing Machinery urged computer scientists worldwide to break off relations with their Soviet counterparts.

This move was rejected in July 1978 by Professor Donald Michie, head of the machine intelligence research unit at Edinburgh University, who called on Computer Weekly's readers to sign a



SCHARANSKY... 13 years.

telegram to Soviet leader Leonid Brezhnev urging that observers from the international scientific and computing community be invited to attend the judicial proceedings.

The trial was held a few days later and Scharansky was sentenced to three years in prison followed by ten years in labour camp.

A bursary for a "refugee scholar" at a British university is to be named after dissident Soviet scientist Dr Andrei Sakharov. The beneficiary will receive three annual payments totalling just over £3,300.

'Big Brother' security system arrives in UK

by Kevan Pearson

A BIG Brother security monitoring system that can continuously track a person's movements is being marketed in the UK by Systemsolve and Photoscan. The system, made by Holland-based Nedap, is designed to monitor the whereabouts, in a building or complex, of employees and visitors.

To track a person it is necessary that they carry a pass card which is electronically monitored at doors, and the information is passed on to a Sperry Univac V77 computer.

The system, called Vortec, relays real time information to the computer which then decides whether the pass being monitored has the right of access to the part of the building where it has been picked up. If not, access is denied.

The pass is automatically recognised when it comes within 70cm of a control point, usually a door. It will be activated whether the card is carried in a pocket or a bag.

Using the information obtained in this way Vortec constantly monitors the movements of individuals as they enter, move around within, and leave a site, the distributors claim.

Each pass is individually coded with an identification code and access authorisation.

where an employee is he can ask the computer to find out which control point was last activated by that person's card. And it can produce lists of who is on the site at any time.

It can also be linked to the payroll system to provide real time monitoring shift and flexitime use, and can be used to switch off heating and lighting when no one is in a room. Using additional software it can be linked with a closed circuit television system.

There is even a function which prevents a card from being used for going through the same control point twice in the same direction without having passed through a point in the reverse direction between them.

The typical price for a system with 10 control points and 1,000 access codes would be about £90,000.

No system is foolproof, however. If two people work in collusion, and one of them has a pass, then provided both parties go through a door together the system can do nothing. But stolen cards are no longer a major problem.

Because the identification code is unique, as long as the loss is reported immediately the system can be told that the code is no longer operative.

If a manager wants to find out

SALES BRIEF

\$3m graphics order from Ford

FORD Motor Company has ordered 210 vector graphics workstations, costing \$3.5 million, from Lundy-Farrington, the European subsidiary of the company Lundy Electronics.

The recently-launched UltraGraf workstations, which contain up to 192 Kbytes of video and screen memory, will be used in Ford's UK and West German factories for car body, engine and factory layout design, drawing at the facilities of its computer-aided design and manufacturing systems both in the US and Europe.

Cobol training

WIRRAL Computer Centre, a Liverpool training company, has installed a 500 Kbyte Univac System 80 with 190 Mbytes of storage and four VDUs. It plans to use the system in a new series of 26-week courses in Cobol programming for 16 to 18 year old students sponsored by the Voc Opportunities Programme, as well as for administrative work.

Allied addition

ALLIED Bakeries is adding a further Honeywell DPS 8 dual processor system to its Liverpool database control centre, which holds information used by 46 bakeries around the UK. The company has had one dual processor DPS 8 and 50 Honeywell Level 6 minis in operation for three years.

Export success

SHEFFIELD-based engineering computing specialist Day Computing has won a £200,000 export order from Chemische Werke Huls of West Germany for Copaid, its planning and material control package, for use in constructing chemical plants throughout the country.

NCR replace

ELECTROLUX subsidiary Columbus Dixon, the Wembley-based industrial floor polisher maker, has replaced its NCR 824 with another NCR machine, an 8430.

Infra-red gauge

INFRA-RED Engineering of Maldon in Essex has won a £165,000 order from BXL Plastics of Bromborough for infra-red thickness measuring and control systems. The IR FG4 gauge will be used to measure plastic film 200 microns thick, while the IR DP4 process will produce average thickness and deviation records and set off an alarm if the upper or lower limits are exceeded.

Supervision

THE Solartron Industrial Systems division of Schlumberger has won a £400,000 contract from the Central Electricity Generating Board for a plant supervision system at Egghborough power station in Humberside. The system will be based on five 512 Kbyte Digital Equipment PDP-11/24s running software developed on a DEC RSC 11/23 by the CEGB, using its own programming language Conit.

VLSI design

ITT subsidiary Standard Telecomunications Laboratories has ordered a Prime 750 to run a suite of programs it has developed for logic simulation and automatic layout in the design of linear and digital VLSI, very large scale integrated circuits.

DG for Britvic

BRITVIC has installed a £50,000 Data General CS/50 supplied by Bute Business Systems of London to provide purchasing, supplies and other management information via terminals or a microfiche output device.

The Lady Henrietta Foxglove has a lot to choose from.

Our second advertisement is on the subject of choice.

As a new Authorised Distributor for Digital[®] terminals, we want you to get just the right equipment, just when you need it.

With all the excellent service, speedy delivery and technical helpfulness which Abacus is capable of.

So we asked our talented and charming model, The Lady Henrietta Foxglove, to pose for a picture symbolising all that. (Digital: you will remember, is the botanical name for Foxglove).

Didn't she do well!

So well, in fact, that we've taken Henrietta in another characteristic pose, and printed a limited edition of delightful posters.

Hurry up and ask for yours. It's going to be a collector's item.

Ring Abacus for Digital, now.

Typical Digital items in stock at Abacus:

VT 100
VT 131
VT 101
LA 120
LA 34
LA 100
VT 18X
Robin personal computer
VT 125

Plus all options & accessories.

Abacus Electronics PLC.



For Digital Terminals
Ring Abacus
Comma Division
0277 811131

Authorised **digital** Distributor
TERMINAL PRODUCTS

Real graphics needn't cost the earth

£1985

The new WESTWARD 1015 is designed and built as a professional graphics display yet costs little more than an ordinary VDU. Built in Britain the 1015 offers all the features you expect from a quality graphics terminal coupled with an exclusive ergonomic design to ensure user comfort.

Screen adjustable for viewing height and distance.
640x480 variable resolution.
Software compatible with Tektronix 4027, GND, and PLOT 10.
24-line character VDU display fully compatible with DEC V152.
15" P33 green phosphor tube.
Support for hard copy, label and plotter options.

If you need a real graphics terminal call us now on (0684) 296600 or write to Westward Micro Systems Limited, Alexandra Way, Ashchurch, Tewkesbury, Gloucestershire GL20 9BN.

WESTWARD
A step in the right direction

Westward 1015 is a registered trademark of Westward Micro Systems Limited. DEC is a registered trademark of Digital Equipment Corporation.



University of Birmingham
THE LUCAS INSTITUTE FOR ENGINEERING PRODUCTION
Residential Executive Short Course Centre

HANDS-ON MICROCOMPUTER WORKSHOP

May 24th-26th, 1982
This course will provide participants with the opportunity to gain hands-on experience using microcomputers and software packages. IBM 8082 computers will be available in sufficient numbers for one machine to be shared between every two course members. Both commercially available software packages and specially developed programmes in the fields of Data Manipulation, Statistics and Operations Research will be demonstrated. Participants will be given the opportunity to run the packages and programmes during the practical sessions.

SIMULATION OF INDUSTRIAL SYSTEMS II

June 21st-25th, 1982
This more advanced course is intended for those who already have considerable experience in simulation using ECSP, or who have extended the introductory course. Simulation of industrial systems I. More advanced simulation techniques will be covered and course members should be prepared to present either case histories or individual problems in the application of ECSP from their working experience. In the latter part of the course facilities will be made available to work on individual problems with the aim of developing and testing programs.

Applications and enquiries to:
The Booking Secretary
The Lucas Institute for Engineering Production,
Edgbaston Park Road, Birmingham B15 2RA
Telephone: 021-456 0821

CSA calls for privacy Ombudsman

by David Cravie

WITH the oft-repeated call that a government White Paper on data protection is overdue, the Computing Services Association has released its own position paper which calls for an independent Ombudsman to oversee personal data administration.

The CSA has voiced the growing concern that British industry could face similar problems to those of the European Community data, the Council of Europe's Convention for the protection of privacy of the individual is ratified by the end of this year.

Home Office Minister Timothy Raison has indicated that the government is coming around to the view that there should be an independent regulator for computer systems which handle personal files.

The CSA proposals for legislation would:

- Give individuals the right to privacy of information and legal protection against its misuse;
- Require registration of personal files, except common operating files, such as payroll;
- Allow cases of alleged misuse of personal data to go to court.

CSA push for govt contracts irks unions

by David Craver
A CAMPAIGN to get the UK government to spend more of its data processing budget with computer service companies could lead to confrontation with the trade unions.

The Computing Services Association, representing 190 companies, has issued the government with a five-point plan which it hopes will change what it says is its "derisory" performance in spending on computer services.

The CSA plan would lead to big turnkey projects like the Inland Revenue's computerisation of PAYE and the Department of Health and Social Security's Camelot scheme being contracted out to the private sector.

But Leslie Christie, assistant secretary of the Society of Public and Civil Servants, says: "If private computer service companies are sent in to do government work, it will not be tolerated by the union members."

Roger Graham, president of the CSA and chairman of BIS Applied Systems, agrees that the trade unions could be a stumbling block to the procurement plan.

But he says there is no question of reducing DP employment in government, and the estimated 15,000 central government jobs should be guaranteed.

Graham adds that by working with private service companies, union members would benefit from "technology transfer."

CSA's argument for more government purchases of computer services hinges on its contention that the "UK government trails other major powers in using its position as a customer." It points to the US, where 27% of computer service companies' revenues come from federal or state agencies, and to France, where the figure is in the order of 20%.

In contrast, central government contributes only six to eight per cent in the UK, nearly 13% if the entire public sector is included, according to a survey of the top 10 UK service companies. Ministry of Defence spending does not form



GRAHAM... Government performance "derisory" in spending on computer services.

part of the UK data.

For several months, a number of working parties involving CSA and the Central Computer and Telecommunications Agency, the government's buying arm, have been looking at ways to increase the participation of computer service companies.

It will be a month at least before any formal proposals come out of the working parties, but Gerald Watson, head of CCTA, says: "Yes, I am sure they will get more work."

That is because there is a shortage of resources in the Civil Service, but in any case there are very few projects of any size in which computer service companies are not already involved, he says.

There is potential for more business in facilities management, an area which has a long tradition in US government departments, but which has only been on offer in the UK over the last few years, he adds.

The trade unions, Watson agrees, are very sensitive to the

System will support up to 250 workstations

by Robert Parry
ADDING to the range of hardware to support its specialist insurance application packages, Internet, of Dorking, is taking on UK distribution rights of an Ethernet-like network of workstations, the American Scientific Data Systems' SDS 400.

The system can support up to 250 workstations with shared access to mass storage, though a more practical limit would be around 100, according to Internet director Ken Groom.

The file server can run 62 Mbytes of Winchester hard disc storage, but sub-servers can be added to the network if more shared storage is needed, Groom adds.

Each workstation, based on a 6502A microprocessor with 64K of memory, can also support up to 62 Mbytes of local hard disc storage. The practical limit on the number of workstations on the network is

Twenty dismissed - and another 20 resign at CACI consultancy

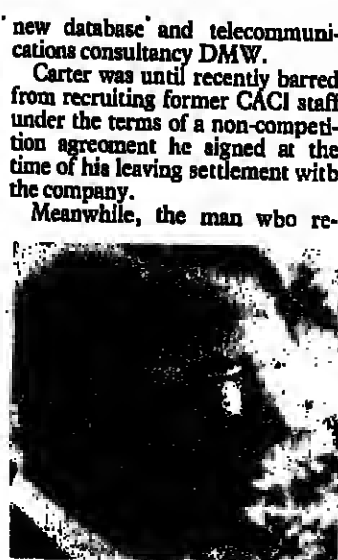
by Boris Sedacca
STAFF are beginning to leave troubled consultancy CACI of their own accord following the sackings which have taken place since last May. And at least one employee has reached the first stage of a hearing by an Industrial Tribunal on his complaint of unfair dismissal.

Over 20 people have been dismissed as part of the 40 who have left since last May.

The latest to go is Terry Wilcox, who has resigned from his post as department manager for advanced technology. "Being with CACI was unsettling," he said.

He could not cope with the loss of two bosses in six months, he added.

Wilcox formerly worked at CACI for Tony Carter, previously chief executive for European operations who was replaced last May. He is now to join Carter's



CARTER... Hired his former staff from CACI.

new database and telecommunications consultancy DMW.

Carter was until recently barred from recruiting former CACI staff under the terms of a non-competition agreement he signed at the time of his leaving settlement with the company.

Meanwhile, the man who replaced Carter and who was himself later sacked is resisting the terms of the leaving settlement he has been offered. Ian Palmer, former senior European vice-president, was axed by the new chief executive officer for European operations Ron Steorts, the man responsible for over 20 staff losing their jobs since last May.

One of them is Tony Yates, formerly manager of CACI's Birmingham office, who has taken his case to an industrial tribunal claiming unfair dismissal.

However, another former staff member has accepted his leaving terms. "I have come to a reasonable settlement with CACI," said Jay Metcalfe, formerly in charge of the company's legal affairs.

Throughout the staff departures over the last six weeks neither Steorts nor any other company spokesman in London has been available for comment.

Getting in on the 16-bit act

by Robert Parry
SOFTWARE houses eager to get in on the 16-bit microcomputer act are racing to bring out application packages for the Sirius 1, 50, and 100, according to UK distributor ACT Microsystems, that has placed a special order for extra machines to meet their needs.

ACT has also set up a division co-ordinate and market progress for the Sirius and the compatible IBM Personal Computer, both of which use the Intel 8088 microprocessor.

"We are virtually under siege," says Barry Jacques, ACT Microsystems' managing director, claiming that by the end of the year the Sirius 1 will have a wide range of software than any other microcomputer in this country.

The machines so far defined - "hundreds" according to ACT's Chris Buckham - are mainly gone to software developers, but they are starting to go out to end users in volume, he says.

"Shrink-wrapped software" in the form of the standard Wordstar, MicroModeller and SuperCalc packages.

As well as releasing Sirius versions of these packages, ACT is transferring users, including minicomputer-based commercial software, from its turnkey unit division. On the operating system front, the IBM Personal Computer's MS-DOS from Microsoft should be available from next week.

According to Buckham, over 50 companies are working on software for the machine, headed by software houses like Compuserve and TABS. As well as commercial packages like Lotus development is under way for software-controlled add-on devices to emulate various communication protocols from Millhouse Design of Alton, Hampshire, and a printer adapter from Bolton-based B Computers.

When the machine was launched in this country last November, designer Chuck Pettit, who also developed the Commodore Pet - said that the marriage between Sirius and ACT was a software strength, was needed to sell the machine.

He saw the marketing, depending on professional programmers using it to write friendly applications, and the hardware, on to end users.

With the level of software activity for the machine, things are good from this viewpoint.

Ethernet close to US standard acceptance

by Donald Kennett
XEROX'S campaign to establish its much-publicised Ethernet local network specification as a world standard is nearing fruition. Only minor differences separate the specification from an influential standard for high speed local networks being drawn up by the Institute of Electrical and Electronic Engineers in the US.

According to Xerox office products division vice-president David Liddle, one of the original Ethernet design team, only five technical details of the IEEE's draft proposal are still different from the Ethernet specification.

"In recent months we've come from being quite different to being very similar," said Liddle.

The IEEE is a US body but its standards are followed widely in the rest of the world. It previously endorsed Hewlett-Packard's GPIB general purpose interface bus into the IEEE 488 standard and has also put its weight behind a video-up version of the S-100 bus for microcomputers.

Xerox got together with Intel and Digital Equipment two years ago to promote Ethernet as a vehicle for its future range of communicating office products and the scheme has since generated considerable interest. Out of 270 companies that have asked for licences to use the Ethernet design, 22 are developing products: five, network transceivers; nine, interface controllers; four, controller chips; three, cable; 10, systems; and 10, compatible attachments. Twenty of the 270 are in Japan and 75 in Europe.

Installations have been made at 35 sites in the US since last summer and another 60 are in process. In the UK, the first installation is due to be made this month.

One problem that arises from the differences that remain between the specification and the IEEE standard is that Intel has already committed itself to a VLSI chip design for the Ethernet controller and is planning to supply sample quantities of it before the end of the year. DEC too plans to start introducing interface products in the next few months.

The five differences are the pin layout between the transceiver and the controller, the polarity of the "collision detected" signal, the way the packet preamble ends, the method of disabling the transceiver and the number of bits in the address field.

The IEEE allows addresses from eight bits to 56 bits in multiples of eight bits, while Ethernet has a fixed 48-bit address. The IEEE requires a disable wire to tell the transceiver to switch itself off, while Ethernet relies on the power line on its own. The IEEE requires an eight-bit pattern after the synchronising preamble before the packet starts, while Ethernet specifies a single start bit.

Draft of the IEEE 802 standard is likely to be agreed this month and published by April, Liddle said.

The Ethernet specification relates to the bottom two layers of the International Standards Organisation's seven-layer model for Open Systems Interconnection and these are generally agreed to be insufficient on their own to allow systems from different manufacturers to be interconnected.

So the companies are talking to the European Computer Manufacturers' Association about levels



LIDDLE... "From quite different to very similar."

Three and Four, the Network and Transport layers, and they claim the support of several member companies for their proposals. Beyond that, Xerox plans "a whole raft of higher level standards" for things like packetised voice messages, graphics and special applications as the need arises.

DEC and Intel also plan to publish higher level proposals, expecting all three to differ because of the different markets and types of application they serve, but they will be publicly available so that others can implement them to make their systems compatible.

French govt orders home-made micros for secondary schools

by Jack Gee
THE first part of a large order to put microcomputers in French secondary schools has gone to two home manufacturers, Logabax and Leanord.

The Education Ministry has placed an order for 2,200 microcomputers as the first step towards a final total of 4,400.

The order marks the intention of the government to revive a school equipment programme which it suspended after taking office last summer.

Education Minister Alain Savary now seems likely to carry out "Operation 10,000 Micros" launched by his predecessor, Christian Beullac, during the presidency of Valéry Giscard d'Estaing.

About 300 high schools have been equipped with microcomputers since 1979, with an average of eight units for each school. A further 200 schools would normally have received micros this year.

The number of schools involved is now likely to be only 100. But the level of orders from computer manufacturers will reach the same level as under the last government.

The objective of "Operation 10,000 Micros", which appears to have been adopted by the government, is to use computers and line printers as aids for teaching languages, history, geography and mathematics.

Daniel Gras, a Ministry of Education official, announced that training centres, each equipped with a score of computers, will also be opened this year to train 200 teachers by Christmas.

Gras added: "The plan is to have a teacher qualified to initiate high school students in each school."

With 6,000 microcomputers scheduled for installation in French schools by the end of 1982, all the major manufacturers have been competing for orders.

Logabax, which has supplied 1,000 units since 1979, now gets an order for between 1,100 and 2,200 micros for this year. The same quantity has been ordered from Leanord, a small firm with a staff of 100 near Lille.

Leanord specialises in designing electronic equipment for laboratories and industry.

Brazil threatens to pull out of Third World aid

by Rory Johnston
A MAJOR threat is hanging over the Inter-governmental Bureau for Informatics and its \$1 billion plan for computers for the Third World. One of the IBI's most important member states, Brazil, is thinking of pulling out because it is getting too little return for its money.

As to the overall \$1 billion programme, Bernasconi describes himself as "quite confident" of success. He has already collected a number of projects for it from both developing and developed countries.

His relations with UNESCO, strained last year when the UN agency accused the IBI of encroaching on its territory, are improving, he says. Conflict is being eased by discussions on co-operation starting this month, and UNESCO Director Amadou-Mahtar M'bow is due to visit Rome in April to approve the joint plans that will have been worked out.

The laboratory would be set up in the capital, Brasilia, and would

XENIX

THE UNIX OPERATING SYSTEM

developed by Bell Laboratories is an interactive multi-user, multi-tasking system, with a comprehensive range of applications.

XENIX-1S UNIX VERSION 7

packaged by Microsoft.

XENIX-11 IS THE DEC PDP-11 IMPLEMENTATION

available for all computer types from the PDP-11/23 to PDP-11/70.

LOGICA PROVIDES XENIX-11

at a sensible price with full installation, training, support and maintenance. The benefits of using XENIX include:

- improved quality and productivity in software development
- better quality control and software project management
- software portability and re-use of software tools
- integration of complex text processing requirements

XENIX is also being implemented on Zilog 2800, Intel 8086 and Motorola 68000 16 bit micros.

Find out about XENIX at our next day seminar

Fee is £36 + VAT per day. For full information contact Kathleen Farrell, Logica, 64 Newman Street, London W1A 4SE. Tel: 01-637 0111. Telex 272.

logica

Colour Communicates...

• Ideal for Viewdata, Prestel, etc.

• Business and micro-computers

• Point of sale displays

• Learning & communication terminals

...with L.C.C.D.

LOW COMPLEXITY COLOUR DISPLAYS

This unique and economical Low Complexity Colour Display developed by Microvitec is a high-performance modular VDU designed to be driven directly from any logic source, to produce alphanumeric and graphic displays in sparkling colour with a clarity and legibility unmatched by normal TV monitors or modified broadcast receivers. In addition to economy, the LCCD offers a high:

- quality specification including:
 - 14" or 20" screen sizes
 - 525 line 60Hz/625 line 50Hz operation
 - Fully isolated switching power supply
 - Direct RGB interface
 - Standard or high-resolution options
 - Available in desk format
 - Uncluttered chroma-keyed frame
 - Moulded structural frame case
 - Modular design

These are expected to reach 2,000 civil servants by the end of 1982. Other one-day courses for senior staff on topics like "the impact of microcomputers" will be provided by the Civil Service College.

There are also changes in courses for civil servants directly involved in data processing. A package of commercial systems design has been brought in and will be adapted to the needs of government projects under the guidance of CCTA.

Microvitec Limited, Futures Way, Belling Road, Bradford, W. Yorks. BD4 7TU. Tel: (0274) 390011. Telex 51771.

Training for civil servants

by Philip Hunter
THE Civil Service is introducing new training courses in the hope of enlightening its members about information technology.

Top administrators and managers are being sent on a three-day course at the London Business School, while less senior people will attend seminars lasting between two and five days organised by ICL, IBM and the Royal Military College of Science.

Follow-up courses will be provided by the Oxford Centre for Management Studies.

Middle Civil Service grades will have their awareness awakened by a programme of 40 one-day seminars, whose material will be embodied in a course reference manual.

These are expected to reach 2,000 civil servants by the end of 1982. Other one-day courses for senior staff on topics like "the impact of microcomputers" will be provided by the Civil Service College.

There are also changes in courses for civil servants directly involved in data processing. A package of commercial systems design has been brought in and will be adapted to the needs of government projects under the guidance of CCTA.

Satellite links to oil rigs

by Donald Kennett
COMPANIES needing to exchange data with oil rigs or ships at sea should find services improved following the introduction of a new maritime communications satellite over the Atlantic.

The satellite, Marces A, was inaugurated last week by the International Maritime Satellite Organisation Inmarsat, after it had been manoeuvring into position and undergoing tests since its launch by the European Ariane rocket in December.

It is now providing 40 communications channels for high-speed data, facsimile, telex and telephone traffic over the Atlantic Ocean and bordering territories from Northern Europe to southernmost America. It is due to be placed in orbit late next month by a second satellite, Marces B, which will do the same job for the Pacific Ocean and territories.

The satellites were built by British Aerospace with the on-board electronics from GEC-Marconi Space and Defence Systems designed to minimise the performance required of the ship-borne transmitters and receivers.

But the next generation of system for maritime satellites now under development is expected to support even simpler and cheaper ship-borne terminals.

Teletel trial success with young families

by Jack Gee
TELETel, the French videotex experiment now under way in a Paris suburban district, has opened with 96% efficiency during its first six months in service.

Pierre-Destrade, regional director of telecommunications, said: "We have recorded a technical failure rate of only 4%. This is very encouraging."

The Teletel experiment has involved the installation of terminals in 2,200 homes around Versailles. Residents are making an average of two calls weekly from each terminal, with a duration on average of 15 minutes per call, during which they consult three or four of the 150 information services available.

Teletel is much more popular among young couples with children than with the elderly. Middle class residents make considerably more calls than working class families.

Teletel promotion chief Dominique Lamichie said: "We were told that after a few months the majority of Teletel would give way to the Internet. But traffic has remained steady and interest is as high as ever."

The most sought-after service is the French electronic newspaper, which offers magazine-type articles as well as news.

Cellular radio services for New York

by Donald Kennett
COMMUNICATION services based on the novel technique of cellular radio are planned by a New York company being set up by three former officers of the Federal Communications Commission, the US telecommunications and broadcasting regulatory body.

Cellular radio is a technique devised to increase the number of people able to communicate over a given set of frequencies. This is done by dividing up an area into cells into which transmissions with a limited range are made. The scheme has been adopted by the Mercury alternative telecommunications network in the UK as a fast way of setting up links to customers' premises.

The FCC has confirmed the arrangements it proposed last April for licensing cellular radio services. Under them, frequencies would be allocated to two competing services in each area, one of them provided by a telephone company.

The new company is called Cellular Communications and its president is William Ginsburg, former FCC deputy chief for policy. Charles Ferris, former FCC chairman, and Thomas Casey, former deputy chief for operations, are among the principals.

Centronics has high hopes for colour printer

by Philip Hunter
AN advanced colour printer is close to completion at Centronics, the world's second largest printer manufacturer.

An announcement is expected soon as one of a series of moves aimed at restoring profitability to the financially sick giant.

The colour printer will be based on a new impact method of putting marks on paper. "Colours can't be printed with dot matrix printers," explained Terence Harris, vice-president of European operations.

"You can't get the dots close enough, and if you have them closer, you get into problems with bending of the impact wires and unreliability."

Centronics recently revealed its long-term view of the printer market and believes that colour will play a vital role in the office systems and small business area, in

parallel with the continuing development of quiet printers.

It expects to announce the much talked about Quiet Writer at the end of the year for the small business market. This uses a stylus attached to a flexible frame, which can be programmed to enable, in principle, the printing of any style of character. Centronics has already introduced the first of a range of quiet printers and announced the 350 series, a new range of dot matrix printers, which replaced the obsolete 700 series last November.

The company blames last year's losses on manufacturing mismanagement, inventory write-offs, and high interest charges on previous debts. These problems have been alleviated by a recent deal in which Control Data stepped in to invest \$24 million and its 60% of its subsidiary Computer Peripherals Inc (CPI) in Centronics in



HARRIS... New method of colour printing.

return for 35.5% of Centronics shares.

Control Data claims that it approved the deal to give itself access to a wide spectrum of printers. "Centronics is strong in medium and slow printers, while CPI pro-

duces fast printers," says a Control Data spokesman.

However, CDC has not made a success of selling its printers, and is reckoned to be relieved to surrender the marketing of them to Centronics.

560% rise in distributed data processing market by 1986 - IDC

by Andrew Thomas

THE Western European market for distributed data processing (DDP) will rise 560% from \$300 million in 1980 to \$2.8 billion in 1986, when almost 20% of small processors will be used for distributed intelligence, compared with under 10% at the beginning of the decade, says a report* from International Data Corporation.

IDC says that 42% of the revenue from the DDP market now comes from clustered terminal systems, and that by 1986 they will account for 50%. Minicomputers will continue to decrease in importance.

DDP environments will provide the largest market for clustered terminals, rising from 49% in 1980 to 70% in four years' time.

In 1980, the number of screens delivered for use in clustered terminal systems was 43,000 units. With an average value of \$10,000, this represents a total revenue of \$430 million. IDC predicts that, by 1986, there will be an increase to 200,000 units, giving \$2,000 million.

At present the market is shared between a variety of European and US manufacturers, but IDC sees

the IBM 8100 having a significant effect, gaining up to 60% share, with 70% of the units being installed in DDP environments. IDC describes the 8100 as a "slow starter," which is beginning to make its presence felt in the marketplace. The total number of clusters shipped in 1980 was 800, but by 1986 this figure could be as high as 17,000.

The UK, France and West Germany account for almost two-thirds of the European DDP market, with West Germany slightly ahead. This is unlikely to change by 1986, despite the IBM penetration of smaller countries.

The report cites user enthusiasm as a common problem, with time users expecting too much of their new systems, but the provision of hardware and software support at remote sites also causes difficulties.

Most users moving to DDP tend to add small processors to their configurations rather than replacing their mainframes, and a significant 60% remained with the new hardware supplier.

* Terminal Markets in the Distributed Data Processing Environment - Western Europe, IDC Europe Ltd, 2nd Edn, London W4 1LN, £1.20.

Japanese memory leapfrog

by Kevin Cahill

IN an expensive game of leapfrog, Japanese microelectronics manufacturer Toshiba has abandoned the race to produce the next generation of dynamic memory chips with 256K capacity.

Instead, the company is planning to invest 20 billion yen in a plant which is designed to deliver one-megabyte chips in volume by the end of 1984.

An experimental one-Mbyte RAM is expected to be available some time in 1983.

The common explanation for the direction now being taken by one of Japan's leading semiconductor manufacturers is that it is conserving resources. Toshiba seems to be hoping that its principal Japanese competitors will be concentrating on 256K chips, while Toshiba itself is busy cornering the next advance in the memory market.

There is a precedent for this. During the VLSI project, so which Japanese computer companies spent around £120 million, Oki Electronics was ignored because of its minuscule presence in the semiconductor business.

While the project was under way, Oki set up its own chip manufacturing plant, but effectively bypassed the existing industry standard 4K and 16K and began operations by mass producing the next generation of chips, with 64K capacity.

Although most of Oki's (DRAM) production is still used internally, the decision to concentrate on the next generation of chips ahead of existing producers pushed the company from nowhere to about the fourth place in the league of Japanese chip producers.

And the company used this base to develop a 256K DRAM of its own in parallel with the companies which took out patents from the 26K VLSI project.

Oki began delivery of sample 26K DRAMs last September and certainly looks set to be among the top three or four producers in Japan, if not the world, when the 26K is the industry standard.

With rivals NEC and Hitachi moving production of 64K DRAMs to one million a month and Hitachi determined to mass produce 256K DRAMs late this year, Toshiba have obviously decided on a variation of the Oki strategy and gone for the next generation.



PANTON... Lawsuit ended relationship with ECS.

Telecomputing romps through the £2m barrier - despite the lawsuits

by Kevin Cahill

TELECOMPUTING Holdings has put its legal wars with ICL and ECS Microsystems behind it and turned in sales of £2.03 million, up £430,000, in the year ended September 31, 1981.

Last year Telecomputing was awarded over £750,000 from ICL - £400,000 in cash and £350,000 in credits - after ICL breached its agreement to supply Telecomputing's TP monitor software. Micro supplier ECS had its claim of £400,000 against Telecomputing withdrawn on appeal. Neither of these amounts appears in the sales figures.

The second victory soured the commercial relationships between the two companies according to Telecomputing chairman Bernard Panton, and Telecomputing is no longer selling ECS equipment.

Profits were trimmed to a slim £20,138 last year after Telecomputing Systems Ltd, a subsidiary company, had been written off last August at a cost of £244,000.

The residue of Telecomputing Systems Ltd has been transformed into a joint venture between Telecomputing Holdings and some of the former engineers and staff. It now trades as Telecomputing Microsystems Ltd.

A decision on a replacement supplier for ECS has not yet been taken by Telecomputing Microsystems, according to Panton.

The first quarter of the current financial year has restored the company to a healthy profit of £64,462 on turnover of £392,000. Panton is predicting that it will once again break the £2 million barrier in 1982, with profits on target at £250,000.

The company has re-established a working relationship with ICL, and recently bought a ME29 via the credit established as part of the legal settlement.

One of the ICL bureaux in South Africa has also bought two of Telecomputing's TP monitors. This year the company will

launch new versions of the TP monitor TPS, and both Panton and Telecomputing's technical director John Garrick expect to win substantial orders. TPS is already running in two sites.

Garrick says that there is severe criticism of the ICL TP offering TPMS on the VME operating system, and on the TME/TP software when working in isolation, not to mention when they are required to work to a network such as IFA.

The new TPS, on the other hand, provides uniform user interface, and the old 1900 image is gone," he said.

Novel service

BOC Datasolve is to offer an IBM 4300 service based on its Arndahl and IBM large mainframe computers. In a novel approach the company is offering a service which simulates a 4300 in the user's office. Prices start at around £6,000 a month.

Protocol conversions

by Boris Sedgess

THE Tower of Babel created by manufacturers of office equipment adopting different interfacing methods has created a market for devices to translate the signals between pieces of equipment. A new company, Jaguar Communications, has been established for the primary purpose of tapping this market.

Its managing director, Martin Hewitt, says there will continue to be an enormous demand for protocol conversion devices until all manufacturers of computers and terminal equipment conform to a

single communications protocol. "Many UK companies have tremendous expertise in the field of protocol conversion, but lack the resources to market their end product effectively," he said.

"They produce devices on a project basis for a single customer but are not always aware of their potential because these devices are often based on sophisticated hardware designs."

Hewitt claims that his company's independence from any single manufacturer allows him to match the user's needs at the right price.

SDP view on subsidies

by our Parliamentary Correspondent

SOCIAL Democrat MP Shirley Williams has come out for the controversial proposal that the government's employment subsidies (rather than investment subsidies) should be scaled according to the value of the jobs created.

This is so that there would be a bigger subsidy for highly skilled jobs in order to attract the technologically sophisticated, skill-intensive firms which the country needs.

She believes that such a selective

policy would encourage the new technologies to flourish.

But that would not be enough. They would have to be supported by a wider range of policies including training for new skills, adequate venture finance for small high technology companies, faster response to planning permission applications and a programme of government regulation and public purchasing to encourage innovation.

Mrs Williams has also called for management systems appropriate to the new technology.

Raytheon plans fast ICs site

DEVELOPMENT and production of very high-speed integrated circuits is planned for a new microcircuit factory to be built by Raytheon.

The site is next to the company's manufacturing plant in Andover, Massachusetts, and will supplement existing semiconductor production at Mountain View, California. Devices produced at the new

plant will be for internal use by Raytheon's defence systems products and, eventually, commercial electronic products. They will be used as signal and data processors, logic units and computing modules.

Building should be completed by mid-1984, when it is expected that about 30 new jobs will be created. Total staff for the plant will be about 100.

COMPUTASTARS ENTRY FORM

We have read and accept the conditions of entry for the Computastars/Computing 1982 and would like to enter

Main competition Men's teams Women's teams
Small units Men's teams Women's teams
Veterans Men's teams Women's teams
Computing Men's teams Women's teams

Name of team(s)
Company
Address

Name of contact
Telephone
Signature of DP manager or equivalent authority Extension

Position held

We would like to compete in the following region:
NORTH (BARNLEY) MIDLANDS (BIRMINGHAM)
LONDON (ENFIELD) SOUTH (CRAWLEY)

please circle appropriate region
Enclosed is £..... to cover the entry fees for the team(s). Cheques should be made payable to Computastars Ltd.

In all matters relating to the rules or conditions of entry, the decision of the organisers is final.

Please send entry form and fees to Computastars, 117b High Street, Croydon CR9 1QG. Telephone 01-488 6620



Sponsored by Computer Weekly

Dates and venues: Crawley: Saturday, May 15, Enfield: Sunday, May 23, Barnley: Sunday, June 13, Birmingham: Saturday, June 26, UK finals: Birmingham, Saturday, July 24.

If you have a query on Computastars please get in touch with the organisers at 117b High Street, Croydon CR9 1QG. Tel: 01-488 6620.

Computastars entries close next week

by Andrew Thomas
ENTRIES for Computastars are now well past the 10,000 mark, with the London and Birmingham heats proving the most popular so far.

The small units section is filling up quickly, with some of last year's main competition entrants moving into this new category. Debutants from Manchester, who were in the top ten last year, are one of these, and must be in with a good chance of the small units title.

Silly games are also a feature of the competition, and in the February 11 edition of Computer

Weekly, I am offering a special award for the wildest - a signed photograph of myself. Second prize, two photos.

From runners so far are the Olivetti Brothers (sic), the Flying Grimaldi Brothers from Fison, the Captain Killers, and the current leader, from BOC, the Data Solve Superstars (a men's team).

You tell 'em, until Friday, March 19, to get your entries in, and you can find full details of the rules and regulations in the February 11 edition of Computer

Weekly. Jeff Harrison of Kalamazoo in last year's Dutch final.

Pertec TrakStar™

a new family of 8-inch Winchester drives.



33, 67, and 84 Megabyte capacity for the systems of the 80's.

Superb design incorporates the Pertec TrakStar family of 8" Winchester drives for IBM PC and word processing OEMs. Available now, TrakStar delivers the high performance, capacity and reliability OEMs are looking for in a compact, low-cost package.

TrakStar models offer capacities of 33, 67, and 84 megabytes so you can select the right size drive for your specific needs... economically without compromise.

TrakStar offers ANSI standard formatters to provide ease of integration, using industry standard controllers. The rotary voice coil positioner, hard/soft seeking and an 8-inch floppy form factor are part of TrakStar's unique combination of features that set it apart from the others.

Heads, disks and positioner are in the clean sealed motor, with an unsurpassed 25,000 hours MTBF. The full-redundancy electronics are located outside of the sealed section so that down time is virtually eliminated.

TrakStar is the proud result of Pertec Computer Corporation's commitment to perfecting technology. And it has a lot more to offer because it's backed by the industry leader in OEM customer support.



Get the message.

PRIORITY TEAMCO NOW

IN CENTRAL LONDON

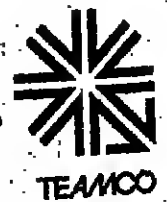
ON SITE AND REMOTE

FACILITIES + VM/CMS

DOS + LINK TO MVS

CONTACT IMMEDIATE

Teamco EDP Limited,
20, Curator Street, Holborn,
London WC4A 1LT.
Telephone 01-405 9125



AIR CONDITIONING

From main frame to micro



HIRE FROM ONLY £35.50 A WEEK

PERMANENT INSTALLATION OR EMERGENCY HIRE

Site Survey • Design • Installation • After-Sales Service.

Birmingham 021-359 5651	London 01-640 3411	Ross on Wye 0989 62064
Bridgend 0646 4301	South 01-903 0081	Rotterdam 01892 4455
Bristol 0272 517923	North 061-834 9737	Sedgfield 0740 20141
Coventry 0203 361038	Manchester 0632 868711	Teesside 0742 386934
Glasgow 041-954 2241	Newcastle 0602 294871	Sheffield 0782 263864
Haydock 0942 723411	Nottingham 0733 72981	Stoke on Trent 0782 263864
Merseside 051 426 2221	Peterborough 0733 72981	Wolverhampton 0902 58111
Liverpool		

ANDREWS & SONS

Andrews Industrial Equipment Ltd., Dudley Road, Wolverhampton WV2 3QB. Tel: (0902) 58111. Telex: 336737

Please send me your Computer Air Conditioning literature
Please ask your Sales Engineer to telephone for an appointment

Name _____ Position _____ Company _____ Address _____ Tel No _____

IBM 4300 needs support - Altergo aims to give it

by Boris Sedacca

AN over-ambitious claim by IBM that its popular 4300 series mainframes would cut out an expensive middleman, the systems programmer, has not materialised. Systems house Altergo plans to capitalise on this with a new service for users.

To achieve its aims, IBM announced its System Installation Productivity Option/Extended, a piece of software which provided users with a ready-made operating system environment for configuring a standard set of software products.

But time has shown that a systems programming function is needed for 4300s, although most 4300 installations are too small to need the services of a full-time system programmer.

Altergo sees a market gap here. "I think IBM oversold SIPO when it first launched the 4300 series," said Dick Jones, Altergo's managing director.

The company has now introduced a systems engineering service to bridge that gap. "We are

offering scheduled visits for software maintenance, but we can also send in our people for longer periods, if for example the user wants to carry out a major enhancement. They do basically all the normal jobs that an in-house systems programmer would be doing."

Jones says that a typical IBM 4331 user will contract for about one day a week, although the company will allow for a minimum visit frequency of one a month.

"It depends on the type of work the user is running. If he is using



JONES: "IBM oversold SIPO."

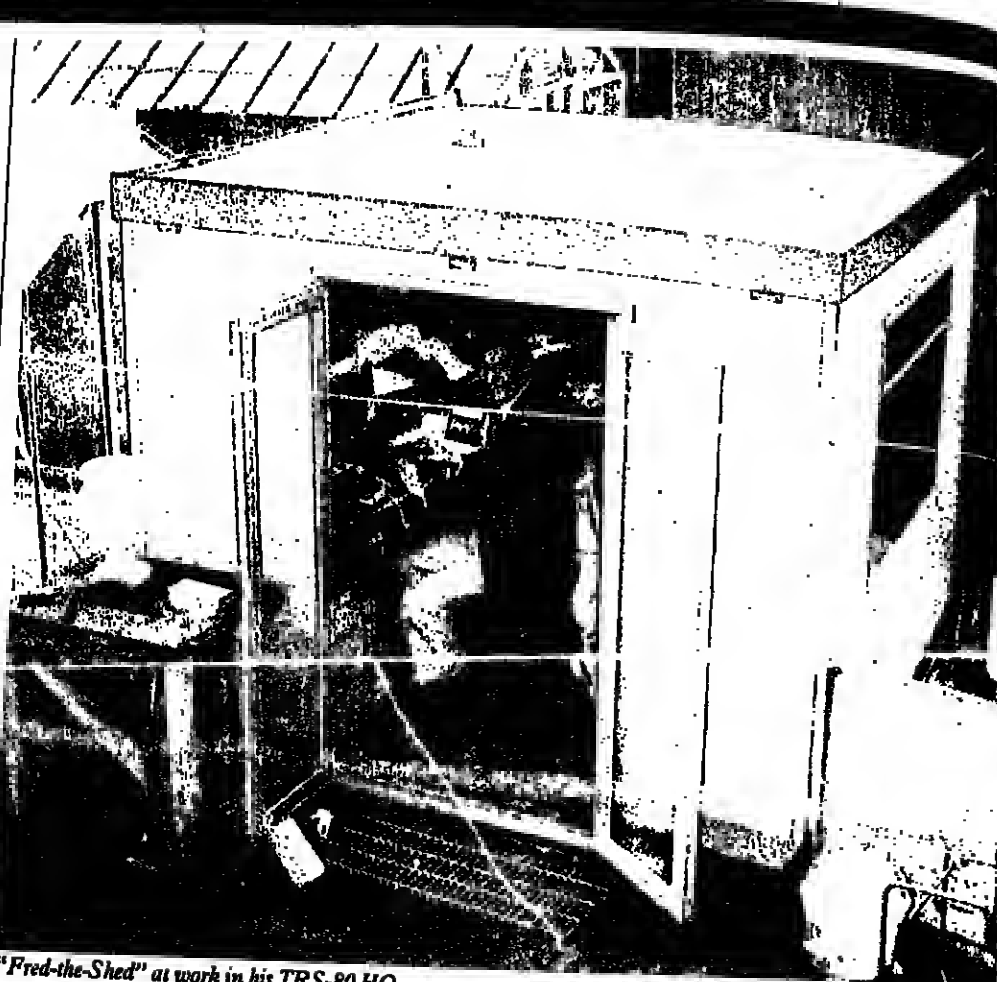
his system as an applications machine with a low level of systems development then one or two days a week, or maybe even one day a fortnight should suffice," he said.

The service is available to any IBM 4300 mainframe installation supporting VM/CMS, DOS/VSE or OS/VSE. A range of options, including software consultancy, installation and maintenance, trouble shooting, and specialist programming services, is offered.

It also covers system tuning to reduce I/O contention and enhance system performance, and system tailoring to ensure that the required facilities are available with the minimum overhead.

These services are less likely to be necessary on IBM's new 4321 because IBM appears to have got its act together better here. The 4321 operating system, Small System Executive (SSE), is a cut-down version of DOS/VSE with restricted facilities, so it goes much further down the road of cutting out the system programmer.

"Fred-the-Shed" at work in his TRS-80 HQ.



Bulletin boards could edge out Prestel

by Maggie McLening

PRIVATE viewdata services are growing rapidly in popularity and could corner the market for local or specialist information, leaving Prestel out on an expensive limb.

When Prestel first started, British Telecom promised to cut telephone charges for Prestel, which might have alleviated the high cost of use, but this has not happened.

The result of this and other factors has been a markedly rapid rejection to the service from the public, and a spate of home-grown viewdata software from a few enterprising companies and individuals.

One such individual is Fred Brown, the UK pioneer of the bulletin board system for microcomputer users, which offers advertising and "shopping by computer" facilities in addition to a message service.

Operating from the unlikely headquarters of a garden shed in Hull in which is housed Brown's Tandy TRS-80, this service has users from Holland, Cyprus, France, Denmark, Sweden, Austria and the UK, plus a very strong following in the US.

Known locally as "Fred-the-Shed" from the days when he used to build garden sheds, Brown is a roofing contractor by trade and also owns a shop called 3-Line Computing from which he sells Tandy equipment and a wide range of software, including his own.

"The bulletin board is really my bobby," he explained. "I opened the shop to help pay for it."

Electronics has always been one of his interests, and he claims to have been only the third person in Hull to get a TRS-80 by 1979. It was originally bought to help with accounts for the roofing business, but a holiday in California gave Brown the idea for the bulletin board.

He brought back a copy of Forum-80, the networking program

widely used in the US, and adapted it for his TRS-80. From this, he then developed his own Mailbox-80 software, which is now in use at Tandy's head office at Walsall and throughout its distributorship chain.

Other manufacturers, such as Commodore and Apple, have been round to glean ideas for their own systems, and Commodore has recently launched the Compet service for Pet users. This, however, is not free of charge, as Brown's is. "My system was England's first public electronic mail system. It's been running 18 months now," commented Brown. He is full of ideas about the uses to which it could be put.

"A system could be accessed by local farmers or doctors, then it could be updated free by drug or chemical companies," he suggested.

Mailbox-80 differs from Forum-80 in execution because it is one large program, instead of some 70 modules, which Brown considers makes it more efficient. Both systems store configuration details for each user, so that they respond with the correct control codes in machines as varied as the Apple, Atari, Videotex, Commodore Vic and the TRS-80. They both will also inform a user of any messages waiting for him when he logs on.

The cost of setting up the "host" of the network is £1,500, which includes a TRS-80 Level II with 48K RAM and 2 disc drives. Further equipment costs are minimal, being the price of a modem and terminal for each user.

Brown is optimistic that such a system has a strong future in the UK.

"Looking at what's happening in the States, I think this should catch on here far more than Prestel once the small businessman becomes aware of it," he said. "I know the equipment is cheaper in the US, but it's now getting cheaper here too, and there'll soon be far more people with computers at home."

Micro project management

by Boris Sedacca

PROJECT management, an application which has for many years been the exclusive preserve of the service "bureaux", is increasingly finding its way onto micros.

Thornwood Manbi Services, a Leatherhead-based bureau and software house, has now launched a micro-based project management package called T-Fert to run on

the CP/M operating system for micros.

Micros are slow but users trade off this inconvenience against that of waiting for work to be returned from the bureau or of hooking up to a time sharing service.

T-Fert allows a user to analyse and monitor up to 750 activities. It is written in Fortran and needs 64K of memory.

ANNOUNCING THE LAUNCH OF THE SOFT OPTION

May sees the start of a totally new journal for software advertisers. That's when Computer Weekly launches SOFTWARE, the first and only regular UK journal exclusively covering this important field. With a controlled circulation of 20,000 drawn from our specialised sources - visitors to our exhibitions (including Compec and Compec North), our computer journals (including Computer Weekly and Systems International) and the vast IPC Business Press circulation file - SOFTWARE offers you the advertiser the unique opportunity to reach the computer professionals you need. The people responsible for buying, specifying or influencing the specification of software services. They represent a market we can't afford to ignore. Can you?

software

First Issue, May 1982

Contact Gordon Bradley 01-661 2404

Looking for low-cost resilience? You don't need a list. A word will do. MOMENTUM!

If you're interested in looking at computers for on-line transaction processing, your list of computer manufacturers can be just about as long or short as you like.

But if you want resilience - the built-in ability of your system to recuperate quickly after a failure - your list will be very short indeed.

And if you want this "availability insurance" without having to take a giant leap to a fully-duplicated system, forget about the list altogether. Just remember a word...

MOMENTUM!

From CTL.
No other computer maker offers you a choice of resilience features, starting with systems costing only

£40K. No other computer maker offers you a standard upgrade path - letting you add resilience in steps as you need it. And no other computer maker offers resilience as a retrofittable add-on to its systems already in the field.

In other words, CTL computers are the only ones with MOMENTUM. Or anything that resembles it. Send us the coupon and we'll give you the word.

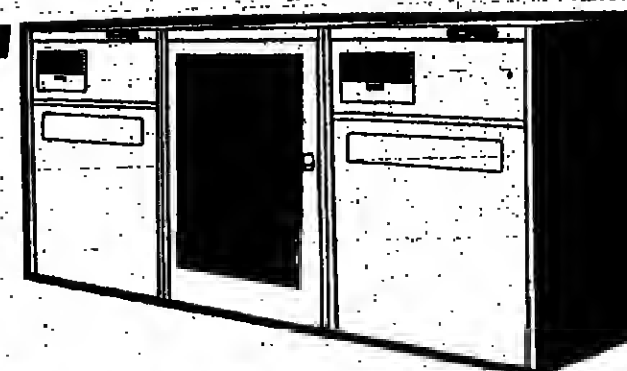
Attention: Roger Fulton.

☐ Please send a copy of your new MOMENTUM brochure.☐ Please contact me for an appointment.Name Job Title Company Address Telephone Ext.

Computer Technology Ltd., Eaton Road, Hemel Hempstead, Herts. HP2 7LB.

Telephone: (0442) 3272. Telex: 826052

The Computers with MOMENTUM



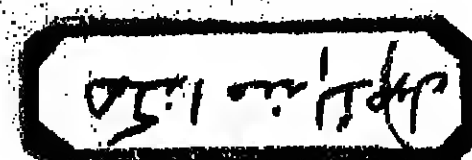
FLASH!

CTL TAKES FIRST PLACE IN
INDEPENDENT USER

SURVEY in the 1981 Datapro "British User Ratings of Computer Systems" survey, CTL ranks FIRST in its class, in the "Overall Satisfaction" category.

CTL

Computer Technology Limited



an I.T.L. Information Technology Company



MARSH... Expect sales of \$100 million by 1986.

\$6m confidence in micro venture

AN intriguing story of American venture capital financing lies behind Keen Computers' latest addition to its range of microcomputers.

The new machine, presented to the European market last week, is the Plexus P40, an advanced 16-bit micro designed around the Unix operating system.

Keen will be the sole UK distributor and Ron Weedon, Keen's chairman, says the P40 will complement the company's existing Onyx product rather than compete with it.

The P40 is substantially bigger and consequently more expensive than the Onyx. The man who links Keen and Onyx and the two micros is Bob Marsh, president of Plexus, which manufactures the P40, and former president of Onyx until he left to form Plexus in November 1980.

Marsh is also president of the Unix User Group in the US.

The extent of his faith in the Unix system, which he describes as an industry standard, can be measured by the fact that he managed the creation of the Plexus P40 around the operating system, and also persuaded investors to put up \$6.1 million in venture capital to help him get the machine out of the door.

Apart from Marsh's \$100,000, and \$300,000 put up by other

Plexus employees, two UK investment institutions, Abingworth (London) and Ivory and Sims in Edinburgh also took shares in Plexus.

Independently of the search Keen was making for a mini to complement the Onyx machine, Abingworth also decided to invest in Keen.

According to Marsh, who did his start-up financing in two rounds, which raised respectively \$1.5 million and \$4.6 million, Plexus should be ready to go public in two to four years' time. By 1986 he expects the company to be making sales of about \$100 million, which looks like quite a temptation to investors given the opportunity to get in on the ground floor.

Robert Parry writes: The Plexus P40 is one of the few machines so far designed specifically around the Unix operating system. The hardware is optimised to bypass Unix bottlenecks with microprocessor-based controllers looking after terminal and disc I/O.

Parts of the operating system are moved down into the Z8000s in these controllers, off-loading the central job processor, which also uses a standard Z8000 - and increasing throughput. Each terminal controller can handle up to eight terminals, giving a maximum of 32 users.

Debts rising as real growth still eludes IBM

THE IBM annual accounts delivered last week show that the company is still trapped in a position of virtual zero growth.

The accounts, which are adjusted for the effects of inflation over three years, show that sales revenues in real terms rose by only \$323 million, or 1.1% of gross turnover between 1979 and 1981.

In current cost terms, which is one of two methods used by IBM to calculate the effect of inflation, the figures over three years are restated to account for specific price rises affecting the company.

The adjusted sales figures for 1979 were \$28.64 billion, \$28.92 billion for 1980 and \$29.07 billion for 1981.

This is a real increase of \$400 million over three years representing less than 0.46% per annum.

Profits, apart from a slight rise in 1980 are down in real terms from \$3.47 billion in 1979 to \$3.24 billion for 1981. The 1980 profit actually showed a slight rise over 1979 to \$3.52 billion.

The key point here is not just that IBM has suffered from inflation like everyone else, but has done so in an industry where real growth, after inflation has been taken into account, is commonly estimated at about 12% to 15% each year.

One of the most savage effects of inflation, however, does not appear in a company's sales figures, however adjusted, but in its liquidity position.

If inflation is really impacting a company, eroding both its profit margins and its capital base, the cash it can generate to meet new investment demands will fall and debt, inevitably, will rise.

IBM has been caught in a deadly pincer movement in this respect.



John Opel, president and chief executive of IBM. After two years in office the formula for real growth has still eluded him.

In 1980 IBM arranged a series of lines of credit, effectively loan commitments, with a series of American and international banks.

Those loan commitments came to \$3.2 billion (not \$5 billion as stated last week) and by the end of 1981 IBM had taken up \$570 million of the loans, mostly in the US.

This increased IBM's long term debt by about 20%, to \$2.66 billion from \$2.09 billion in 1980. Interest charges paid by IBM on the loans rose from \$273 million in 1980, to \$407 million in 1981.

Although the company ended the year with the actual cash position up to \$454 million from \$281 million in 1980, interest receivable fell from \$430 million in 1980, to \$368 million in 1981.

Over the five years beginning 1977, IBM has shown a net deterioration in its liquidity of nearly \$6 billion.

In 1977 IBM had cash and marketable securities worth over \$5 billion and debts that year of under \$300 million.

The current position shows debts of \$2.66 billion and cash and marketable investments of \$2 billion. Despite this IBM has invested

Floating Point sales buoyant

OREGON-based specialist computer manufacturer Floating Point Systems has pushed up sales for the quarter ended January 31 by 47% and profits are up 93% compared with the same period last year.

Sales revenues were \$19.1 million, a \$6.1 million increase on the same quarter of 1981, and a \$1.1 million improvement on the company's first quarter ended October, 1981.

Profits for the quarter were \$3.3 million, compared with \$1.3 million for the same quarter a year ago.

The company, which makes and supplies high value floating point array processors for special applications in the scientific and technical fields, supplied the bulk of its recent sales into two key markets, X-ray tomography and seismic applications.

A full breakdown of the company's sales by market type shows that X-ray applications accounted for 36% of sales, seismic 26% and the remainder was distributed among signal processing (14%), simulation (6%), image processing (2%) and service and repair applications (16%).

The X-ray applications involve the resolution of body images into coherent pictures.

Seismic applications include oil well modelling and oil field structure analysis.

Floating Point has an OEM deal with IBM and Digital Equipment, which decided to buy the company's products rather than compete in this highly specialised field.

Susan Hirsch, a computer industry analyst at New York brokers Smith, Barney, Harris, Upham and Co, says she expects Floating Point to increase the momentum of deliveries of the company's FPS 164 from last quarter's 10 machines to 35 for the remainder of the year.

During that period American inflation has been well into double digits.

MICRO NEWS

Journey into the unknown

AN audio cassette has been produced for all those who need a microcomputer but don't have time to choose the right machine for their business. It runs for 30 minutes - the average journey time into work, according to sponsor Rank Xerox.

The tape, presented by broadcaster Brian Redhead, gives a background to the technology and the terminology, with advice from government, industry, distributors and manufacturers.

David Fairbairn of the NCC, Maurice Gaffney from the DoI, Eric Bird of the NCC's Microsystems Centres and representatives of Apple, Hewlett-Packard and distributor Rank Xerox can be heard on the tape.

The cassette is available from Xerox Stores or direct from Xerox for £5.95.

Perhaps I am lucky that my journey doesn't last that long, but while I was on the train the voice of Redhead in one ear alternating with an expert, or a crash course in recognising types of printer by the sound they make, in the other, certainly beat reading the paper. For one journey, anyway.

Motorola boosts place in advanced micro market with 68000 range chips

THE race for the advanced microprocessor market is hotting up with announcements of new processor and peripheral chips to extend Motorola's 68000 range.

Motorola and US second sources Mostek and Signetics joined forces to announce the devices, which emphasise the view that a single company can no longer go it alone.

By spreading design effort across three companies, it is hoped to ensure a good share of the market for the 68000 family. Motorola estimates the market for 16/32-bit processors, and particularly peripheral chips, to reach \$1,300 million by 1987.

The agreements reached last year between Motorola and what are now termed its co-suppliers, provide for complete technology exchange on 68000 family devices over five years.

Each component will be manufactured by at least two companies, assuring users of a stable source of supply. Family compatibility is promised to ensure a realistic upgrade path when future devices become available.

The new processors from Motorola's design stable spread the 68000 down into the 8-bit world and up to 32 bits. The 68008 operates on an 8-bit bus, allowing the use of cheaper established 8-bit peripheral chips and byte-wide memories, while maintaining software compatibility.

It is scheduled to appear this year, as is the 68010, an upgrade of the current 16-bit 68000.

The 68010 will support virtual memory and virtual machine concepts by means of a virtual memory bus. It is the Redwood development Motorola talked about last year, and by exchanging the processor chips in 68000 systems, performance should be boosted by 25%.

The 32-bit version, 68020, will have the features of the 68010, but a 32-bit external bus rather than the 16-bit. When it appears by the end of 1983 it will more than double performance, Motorola claims.

With these moves in its processor range, Motorola has gone in much the same direction as its current main rival in this area. Intel's 8086 family contains a processor with an 8-bit external bus, the 8088.

It will have a compatible device supporting virtual memory, the iAPX 286, for which Intel announced sampling dates last month.

Its 32-bit offering, the iAPX 432, is not compatible with the 8086 family, but there is persistent talk of a 32-bit iAPX 386 which will be.

Other 16-bit processor manufacturers are offering, or talking of offering, compatible families covering a wide range. Zilog has announced virtual memory support with the Z8003 and Z8004 processors in the Z8000 family, and is developing a 32-bit device called the Z8000.

National Semiconductor is close to making its NS16000 family generally accessible. Major customers have had samples of the 16032 for over three months and various CPUs and peripherals are expected to come out this year and next.

Like the Motorola announcements, these will involve versions of the 16-bit processor with eight-, 16- and 32-bit external buses and specialised processors.

Motorola itself has designed a floating point co-processor, 68881, to interface closely with the 68020, and a bus arbitration module and dual-channel direct memory access controller.

Signetics' contribution, a joint effort with its Dutch parent Philips, is five devices including a dual universal asynchronous receiver/transmitter, now going through initial wafer runs and due for sampling by May this year. It will also be sampling the 68000 in May.

From Mostek comes a single-chip microcomputer with internal ROM and RAM. Expansion capability will allow it to function as a slave peripheral controller in 68000 systems. The company is also now sampling its second-sourced 68000 processor.

The other devices announced were a serial I/O controller, a multifunction peripheral, and a controller for implementing interfaces to the Ethernet local area network.



MAXEY... Lot of interest in the Array 88 design.

CAD systems for gate array circuits flourish

COMPUTER-aided design systems for gate array circuits are becoming more readily accessible as semi-custom devices leap back into favour.

Hot on the heels of systems like Ferranti's ULA Designer and LSI Logic's LDS 1, which recently became available to users for designing and testing their own devices, comes an advanced CAD system for a new series of CMOS arrays from Motorola, to be integrated with its 4-CAS 3000 array CAD system.

Customers should be able to start using this new system early next year.

Initial members of the high density CMOS array family will range from 1,200 to 6,000 gates, with a 4,800-gate model the first to appear.

Plessey has started up a bureau service allowing customers to design circuits from their own premises. Based on a VAX computer from DEC, the service can be used for Plessey's CMOS or Microcell gate arrays.

Meanwhile, Gilsbur Microsystems is reporting a lot of interest in the Array 88 design and consultancy service for CMOS gate arrays from California Devices.

Gilsbur announced the service at the end of last year and now, according to sales manager Mike Maxey, is getting many enquiries. "A lot of people are very surprised at how little it costs to get a gate array," he says.

TEAM UP

with the

MICRO-11 for all your LSI-11 applications

Our advantages

- LSI-11/03, 11/23 or SBC-11/21 Processor
- Up to 256 Kbytes memory
- Full 16 bit processing with memory management and floating point options
- 1 Mbyte floppies optional
- 10 Mbyte Winchester disk optional
- VT100 emulation, or 4010 graphics emulation
- Many plug on options including communications interfaces, parallel interfaces, IEEE bus, etc.
- Wide variety of software available including word processor, data base management, technical and scientific routines etc.

SYSTEMS MIDLECTRON

SYSTEMS DEPT. MIDLECTRON LIMITED, MIDLECTRON HOUSE, NOTTINGHAM ROAD, BELPER, DERBY. DE5 1JQ. RING BELPER (0773382) 6811. Telex 377879.

Switch on faster

with the No.1 DEC Terminals Distributor

Ex-stock at the right price... fitted with a plug and ready to go! makes sense to talk terminals with Rapid Recall.

For years Britain's No.1 Microcomputer Specialist has been the main force in terminals.

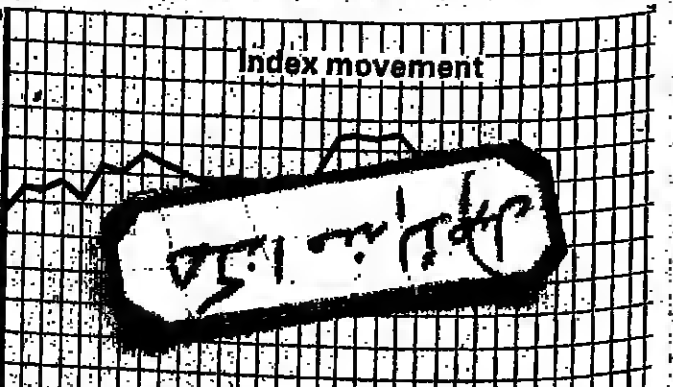
rapid recall for DEC Terminals

CW SHARES TABLE

Delta 9/82		Index: 88.48		Change: -146	
1982	1981	1982	1981	1982	1981
High	Low	High	Low	High	Low
124	121	124	121	124	121
125	122	125	122	125	122
126	123	126	123	126	123
127	124	127	124	127	124
128	125	128	125	128	125
129	126	129	126	129	126
130	127	130	127	130	127
131	128	131	128	131	128
132	129	132	129	132	129
133	130	133	130	133	130
134	131	134	131	134	131
135	132	135	132	135	132
136	133	136	133	136	133
137	134	137	134	137	134
138	135	138	135	138	135
139	136	139	136	139	136
140	137	140	137	140	137
141	138	141	138	141	138
142	139	142	139	142	139
143	140	143	140	143	140
144	141	144	141	144	141
145	142	145	142	145	142
146	143	146	143	146	143
147	144	147	144	147	144
148	145	148	145	148	145
149	146	149	146	149	146
150	147	150	147	150	147
151	148	151	148	151	148
152	149	152	149	152	149
153	150	153	150	153	150
154	151	154	151	154	151
155	152	155	152	155	152
156	153	156	153	156	153
157	154	157	154	157	154
158	155	158	155	158	155
159	156	159	156	159	156
160	157	160	157	160	157
161	158	161	158	161	158
162	159	162	159	162	159
163	160	163	160	163	160
164	161	164	161	164	161
165	162	165	162	165	162
166	163	166	163	166	163
167	164	167	164	167	164
168	165	168	165	168	165
169	166	169	166	169	166
170	167	170	167	170	167
171	168	171	168	171	168
172	169	172	169	172	169
173	170	173	170	173	170
174	171	174	171	174	171
175	172	175	172	175	172
176	173	176	173	176	173
177	174	177	174	177	174
178	175	178	175	178	175
179	176	179	176	179	176
180	177	180	177	180	177
181	178	181	178	181	178
182	179	182	179	182	179
183	180	183	180	183	180
184	181	184	181	184	181
185	182	185	182	185	182
186	183	186	183	186	183
187	184	187	184	187	184
188	185	188	185	188	185
189	186	189	186	189	186
190	187	190	187	190	187
191	188	191	188	191	188
192	189	192	189	192	189
193	190	193	190	193	190
194	191	194	191	194	191
195	192	195	192	195	192
196	193	196	193	196	193
197	194	197	194	197	194
198	195	198	195	198	195
199	196	199	196	199	196
200	197	200	197	200	197

Table shows the closing prices of The London Stock Exchange on Friday and in America on Thursday. The share index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.

* Shares traded on the Unlisted Securities Market or under Rule 143(2)(a).



From ribbons to custom-made furniture

... from magnetic media to data cabinets, from stationary to shredders and from daisy wheels to office furniture - DE is the computer supplies specialist. For over 17 years we've been providing a service second to none - with stocks to match! And with our 24 hour nationwide delivery service on stock items.

you won't find a better company to meet your needs. Send for our full colour catalogue and price list today. Data Efficiency Limited, Maxted Road, Maylands Avenue, Hemel Hempstead, Herts HP2 7LE. Telex: 825554 DATEFF G.

Data Efficiency - for fast, efficient service at the right price!

For advice/service telephone (0442) 57137/8/9/0

Please rush me your latest catalogue

Name _____

Company _____

Address _____

Tel. _____

TERMINALS

ADD GRAPHICS

WITH THE LOW COST HIGH QUALITY SOLUTION

VT 100 GRAPHICS DISPLAY

Now available with plain paper graphics print features

- Full graphics capability
- Tektronix software compatible
- Cross-hatch cursor
- Green raster scan display

• High resolution matrix
- Light pen option
- Retains VT100 features
- Supports graphics packages

In stock now! Prices are single unit quantity. Ex VAT

***Now with DEC field service**

RIVA

RIVA TERMINALS LTD.

Head Office: Working Business Park, 2-3, All Saints Drive, Woking, Surrey GU24 0JY. Tel: Woking (0442) 71001 Telex: 826602

Northern Office: Tel: Harrogate (0438) 503887

Perils of paying too much to get more reliability than anyone cares about

The Ninth Law of Reliability: Investment in reliability will increase until it exceeds the probable cost of errors, or until somebody insists on getting some useful work done.

THERE is a practical, economic limit to how much reliability we should build into a given system. If we let young idealists loose on a programmed system, we can expect them to continue debugging the programs, trying to make the programs perfect. This could take infinite time since nobody knows how to do it.

Fortunately, even young idealists tire of debugging, and they will stop doing so before the program is perfect. But, if we let them stop based on when they tire, we might get far less reliability than our application requires. Not all idealists are equally energetic.

The management answer to these problems is to determine how much reliability you need and can pay for, and to specify the required reliability level in measurable terms.

You might well ask how much reliability you can get for your money. The first issue is to determine a lowest acceptable level of reliability. This is the level below which the system user cannot and will not accept using the system.

A simple estimate would be the present "old" system level of reliability. If the user is satisfied with it, why should the user tolerate worse in a new system?

Next, determine if any improvement is desired, and if so, how much. This forms the basis for the planned level of reliability in your new system.

The system designer then has to determine whether the planned level of reliability is technically feasible, and economically acceptable to the user. This may involve putting together a series of technical design decisions. For example, use Fagan's inspection, test all paths in modules, build a deep database diagnosis program, and use disjoint software plus a checking supervisor to detect and correct errors in operation.

If the solution you propose seems technically adequate (it will probably meet your planned level of reliability) then you can build it provided the estimated costs are still acceptable to the user.

If you cannot find a feasible technical solution, or if the costs are unacceptable to the user, you must find a lower level of reliability which meets both these criteria, or you must search for more cost-effective technical solutions than you have been evaluating up to now.

The technical designer should primarily feel responsible for giving the system user-buyer a choice in the form of a curve of the reliability versus cost levels which can be bought. The user then can pick a point on the curve which satisfies his needs, and the developers can go ahead.

Reliability, in general terms, is the probability of the system doing what the designers planned it should do. There are consequently

many possible measures of reliability for most systems.

It is always necessary to make a tailored definition of the planned reliability for a system. The usual criteria are related to correctness of output, accuracy of output, timeliness of output, and availability of the system. These apply separately to all critical components of the system.

In the eyes of the user, it is the entire system that matters. So we must not fall into the trap of narrowly planning 'program reliability' and leaving the other items to chance.

I wonder how many readers have ever seen or used a plan for database reliability levels, for example using a deep database diagnosis program in random sampling mode (as Bell Labs does) and calculating reliability as auditors do. For example, if 1,000 records at random are sampled without any errors showing up, then with a certain level of confidence you can assert that the file is at least 99.5% reliable.

It is unacceptable in systems planning to see statements such as

are unacceptable to the user, you must find a lower level of reliability which meets both these criteria, or you must search for more cost-effective technical solutions than you have been evaluating up to now.

The technical designer should primarily feel responsible for giving the system user-buyer a choice in the form of a curve of the reliability versus cost levels which can be bought. The user then can pick a point on the curve which satisfies his needs, and the developers can go ahead.

Reliability, in general terms, is the probability of the system doing what the designers planned it should do. There are consequently



Tom Gilb is an independent consultant, lecturer and author of an upcoming book.

I have received from a major British corporation: "...will require work to ensure the availability and accuracy of data..." This contains no hint (in the entire six-page memo stating requirements for a major new production planning system) of the present levels of availability and accuracy, or of the future planned levels.

If these well-intended words are to have any effect in practice, we must, from the start, define them in terms of measurable concepts.

If we do not, there is every danger of the Ninth Law giving us less reliability than we really want, or of having to pay far too much to get more reliability than anybody cares about.

Computer maintenance has become a very big business. A recent survey claims that one leading supplier earns 15% of its profits from maintenance services. This could raise the comment that it is the non-provision of service which contributes to the profit base. Too often users become frustrated at the length of response time and the subsequent inability of the engineer to fix anything more involved than a fuse or tape drive window.

The time when the sales and service manager worked on the same side seems long past. No longer can the user rely on his equipment faults being relayed back to the sales manager, producing not only a prompt visit but a promise of lunch. Now each side seems determined to refute the other.

The main suppliers have got the service message. Response time guarantees are now being offered with the establishment of fault diagnostic centres. By means of a toll free connection, the user has the service of a round-the-clock problem centre which can often identify the problem without the need for an on-site engineer. In most cases the user can replace the faulty unit or be assured that the engineer on his way has been fully briefed.

Given an annual maintenance service turnover of \$3,000m for IBM alone, there would seem an excuse for manufacturers to offer a sub-standard service - even if the service alarm bells ring at 4.30pm on a Bank Holiday Friday.

Alan Simpson

THE PROGRAM WAS COMPLETELY CRIME-PRONE BUT SOMEBODY STOLE THE COMPUTER!

WITH reference to your item "Get Your Own Back" (Downtime, February 25) on senders of unsolicited mail I have often used the following technique when applicable:

Often one is asked to stick a "Yes" stamp on a card on which is pasted a piece of computer printout bearing your own name and a code number. This is first steamed off and replaced by a similar looking printout made on your own site.

The problem is what do we make it say? Well, very often the letter one has received has a signature of the managing director or someone like him and this can be useful since the chances are that the punch card who reads it will probably not recognise the signature of the name and address. Of course, the code number needs to be changed slightly in case the address is irrelevant but unless it is made realistic it will probably fail validation.

The trick here is to smudge or obliterate it such that the name and address are the only usable data items.

Dr DENNIS JONES
ICL Project Team,
UKAEA Winkfield,
Dorchester.

Chief Inspector Alan Richardson, in charge of the welfare department at Lancashire Police Headquarters at Hutton, said: "The computer doesn't read after 99. I think that is the general case with computers. So they have had to start him off again. The computer now thinks he is one year old."

Lancashire Evening Telegraph

Chad

Service men top the DP hit list

SHOULD an industry pull be held to discover the major area of trial and tribulation in the computer industry, maintenance and service would surely come out on top. For once the opinions of computer management, DP teams and users would be united in pointing the finger at engineering services as being No 1 on the hit list.

With hardware costs declining it can be forecast, without the need for a poll, that computer equipment is becoming available to a much wider user base. As demand for computer power increases, so too does the related demand for engineers.

But for once in the computer industry, the normal law of supply and demand does not fully apply. Demand tends to outstrip supply with companies such as IBM having to meet not only their own demand, but those of the recruitment marketplace.

Many DP managers could be regretting that they did not take the engineering trail and study for the City and Guilds rather than the IDPM exam. Recent advertisements in the national and trade Press for experienced engineers suggest that only those with a taste for a Porsche, a mews cottage in Kensington and membership of the Embassy Club need apply.

Computer maintenance has become a very big business. A recent survey claims that one leading supplier earns 15% of its profits from maintenance services. This could raise the comment that it is the non-provision of service which contributes to the profit base. Too often users become frustrated at the length of response time and the subsequent inability of the engineer to fix anything more involved than a fuse or tape drive window.

The time when the sales and service manager worked on the same side seems long past. No longer can the user rely on his equipment faults being relayed back to the sales manager, producing not only a prompt visit but a promise of lunch. Now each side seems determined to refute the other.

The main suppliers have got the service message. Response time guarantees are now being offered with the establishment of fault diagnostic centres. By means of a toll free connection, the user has the service of a round-the-clock problem centre which can often identify the problem without the need for an on-site engineer. In most cases the user can replace the faulty unit or be assured that the engineer on his way has been fully briefed.

Given an annual maintenance service turnover of \$3,000m for IBM alone, there would seem an excuse for manufacturers to offer a sub-standard service - even if the service alarm bells ring at 4.30pm on a Bank Holiday Friday.

Alan Simpson

THE PROGRAM WAS COMPLETELY CRIME-PRONE BUT SOMEBODY STOLE THE COMPUTER!

WITH reference to your item "Get Your Own Back" (Downtime, February 25) on senders of unsolicited mail I have often used the following technique when applicable:

Often one is asked to stick a "Yes" stamp on a card on which is pasted a piece of computer printout bearing your own name and a code number. This is first steamed off and replaced by a similar looking printout made on your own site.

The problem is what do we make it say? Well, very often the letter one has received has a signature of the managing director or someone like him and this can be useful since the chances are that the punch card who reads it will probably not recognise the signature of the name and address. Of course, the code number needs to be changed slightly in case the address is irrelevant but unless it is made realistic it will probably fail validation.

The trick here is to smudge or obliterate it such that the name and address are the only usable data items.

Dr DENNIS JONES
ICL Project Team,
UKAEA Winkfield,
Dorchester.

Chief Inspector Alan Richardson, in charge of the welfare department at Lancashire Police Headquarters at Hutton, said: "The computer doesn't read after 99. I think that is the general case with computers. So they have had to start him off again. The computer now thinks he is one year old."

Lancashire Evening Telegraph

Chad

Chad

Chad

Chad

Chad

ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS
Thursday, March 11, 1982

Legitimate help or subsidy?

A CAMPAIGN launched by the Computing Services Association to press the government to spend more money with CSA members fits nicely into two planks of the government's strategy: to cut the size of the Civil Service and to switch jobs from public to private sectors.

The public sector in question here is DP spending directed by the Central Computer and Telecommunications Agency (CCTA). The policy wanted is one of "enlightened" procurement. (It seems that Kenneth Baker's euphemistic language has spilled over from the Department of Industry to infect the CSA.)

The CSA believes that by making greater use of outside service companies, the public purse would receive the benefit of the productivity gains it claims for thrusting private business.

Its request for a policy on government spending on software is made from an apparent position of strength. The CSA quotes a 25% compound growth rate for UK service companies between 1971 and 1980, which has taken revenues for the sector from £69 million to over £500 million.

But the companies complain their success has been without the help of business they should receive from the government. The CSA points to the US where government spending on outside services comes to over \$4 billion, or 27% of their total billings. In France the figure is something over 20%. Compare that with CCTA spending in 1979-80 of £12 million, or under 3% of sales.

CSA members claim that without government support via a new procurement policy, British software and other service companies risk losing international competitiveness. They say that the most lucrative areas for new business are in health, education and energy, but that they are not getting enough experience in developing all-important reference sites at home. Without them, they are handicapped in chasing work abroad.

But why shouldn't the government do its own programming, after all? Doesn't the call for support for the CSA smack of subsidy?

The CSA would justifiably be indignant if it was lumped together with less fortunate chunks of British industry in needing government work to survive - The "Buy British" not because it's best but because our old-fashioned business will go under if you don't" syndrome. Clearly, its members are not in that class.

It does, however, run the risk of stirring up powerful antagonism. On launching their campaign, CSA leaders made passing reference to its impact on government employment.

The jobs of the estimated 15,000 staff in government data processing (excluding data prep) should be guaranteed, they say, but future growth should be taken up by private companies. State employees would get the advantage of technology transfer from the private sector, and the country as a whole would gain.

There needs to be some demonstration that services to the taxpayer would improve because taxes went on private rather than public spending. Despite Tory philosophy, it doesn't necessarily follow.

Where the CSA has hit the nail on the head is in its call for less secrecy on the bidding for potential contracts, on how they were awarded, on the price of the winning bid, and on completion dates. That information is not available.

It is in everyone's interest to see the facts behind the decisions on where government spending on computer services goes. Apart from the equity of such a procedure, it would follow a path well trodden by other governments which are more open - notably the US. And it is something on which trade unions, government data processing management and the CSA could unite.

1984 and all that... This week's example of the strange things people say about computers was sent in by E. L. Smith of Blackburn, Lancs, who writes:

Chief Inspector Alan Richardson, in charge of the welfare department at Lancashire Police Headquarters at Hutton, said: "The computer doesn't read after 99. I think that is the general case with computers. So they have had to start him off again. The computer now thinks he is one year old."

Lancashire Evening Telegraph

Chad

Chad

Chad

Chad

LETTERS

Cobol revision pros and cons

I REFER to the two articles concerning the proposed Cobol revision by Philip Brown and Alan Morrison (CW, November 5, 1981).

The article by Philip Brown had as its theme "although there are many changes, this should not give rise to many problems". This is in my opinion not true. I think they will give rise to problems in the following three areas:

a) Financial. The conversion of existing programs to conform to the new standard will cost money both in manpower and in machine time. The extent and number of changes will affect this, although not so greatly.

b) Company risks. However much converted programs are carefully tested, it cannot always be 100% certain that they will execute in the same way as the old versions.

c) Delay. Conversion and testing will require time, that could otherwise be spent on improving existing programs or creating new ones.

Conversely, the article by Alan Morrison carried the theme "the disadvantages of the changes are by definition greater than the advantages; therefore, let's not change".

This standpoint strikes me as much too rigid. Changes will often bring disadvantages with them, but that in itself may not be the sole criterion for making the decision to change. I personally try to assess the changes with the following criteria:

a) The change must be required because it covers an existing feature which has become totally obsolete; or a new feature related to new hardware and/or software; or a change in a feature that attains a

high-level, intimacy-exchanging contacts afforded by the golf club. Simply convert the tape library into the 19th hole, and get to know the chairman in the chimney way that can otherwise only be achieved in the togetherness of the bunker.

More seriously, computer room visits may be unwelcome, but they are an inevitable fact of DP management life. They also underline the need to have effective control of access which includes intrusion monitoring - i.e. a selective alarm system that will indicate to the

shift leader that a visitor (rather than an authorised member of the computer staff) has entered, and will tell him when the caller leaves. It is more sensible and less disruptive for DPMs to equip the computer room properly to deal with visitors, rather than curse that visits should have to be allowed.

COMMANDER R. N. D. PORTER
Managing director
Masstiff Security Systems Ltd
Leatherhead, Surrey.

ME29 financial package exists now

FURTHER to Claire Gooding's article ME29 Users will get GL/Plus Financial Management System (CW, February 18), I should point out the following:

Package Programs Ltd (PPL) has had an ICL ME29 version of the MMS General Ledger and Financial Reporting System available for the past year. The first

installation was in February 1981 at Connaught Laboratories in Toronto, Canada and since then we have sold the system to a number of companies in the UK, including Bostik, Lombard Insurance, Bishops Stores and Kwik-fit Euro, as well as to companies in Hong Kong, Australia and South Africa.

The first ICL version of the

minimum Cobol, is not in the proposed minimum Cobol. I agree that INSPBCT should remain.

d. In the proposed minimum Cobol there is no Relative O or Indexed O. Neither are they in the current minimum Cobol.

It must not be forgotten that extensions can always be permitted. For example, manufacturers of microcomputers with floppy discs may decide to include partial or complete Indexed I-O in their Cobol compilers.

In conclusion, I think that the proposed Cobol revision contains such well-qualified elements that the negative points cannot outweigh them. My preference is therefore to give that proposed Cobol revision a positive vote.

I would stress that this represents my personal view only, and should not be taken as an indication of how the Netherlands will eventually vote.

WIM EBBINKHUIJSEN
Chairman
Netherlands Cobol Committee.

IF an "... BLSE DO NOTHING" construct is required for a Cobol statement, what's wrong with "... BLSE NEXT SENTENCE"?

Personally, I'd like to see "PERFORM" ... "DEPENDING" and even "CALL" ... "DEPENDING" options implemented.

Perhaps there would be a case for the compiler's ignoring everything in square brackets [], say, thereby encouraging the use of comments.

CHAZ CONLON
Cumbernauld.

Mr Williams seems to feel that there should be some kind of rule book for recruitment agencies. I have news for him, there is. Most of us conduct ourselves ethically and adhere to a strict code of conduct.

There is nothing wrong in presenting a legitimate opportunity to a prospect who fits the profile of what the client company wants. The prospect can always say no.

ROBERT DENENBERG
Senior managing consultant
Overseas Recruitment
London WC2

British micro

I NOTE you refer to only three British manufacturers in your list of Central Computer and Telecommunications Agency approved microcomputers (CW, February 18).

Our Equinox 200-32, which is on the CCTA list, is a British designed and built machine.

M. S. KUSUMIRAK
Director
Equinox Computer Systems Ltd
London BC2.

MMS General Ledger from Software International was developed and installed by PPL in 1974 and we currently have over 45 ICL installations in the UK, plus more than 40 overseas.

IAN PARKER
Managing director
PPL-MMS Ltd
London, SE1.

Hamilton Rentals Limited
Hamilton House, North Circular Road, London NW10 7UB
London 01-981 6777
Birmingham 021-236 3581
Manchester 061-848 8338/8434

Central Scotland 0501 43182
Aberdeen 0224-25301

Chad

Chad

Tragically under-used

PROGRAMMERS Page (CW, February 25) makes a plea for a DOW NOTHING statement. Algol 68 offers such a facility, the SKIP clause. This is used in contexts such as

IF condition 1
THEN
action 1;
IF condition 2
THEN
SKIP (do nothing)
ELSE
action 2

or frequently, in loops:
WHILE (serial clause, that is, a series of "statements" which eventually ends up delivering a result which is TRUE or FALSE and therefore determines repetition of the loop body and of this serial clause)

action 1;
dependent action 2;
condition depending on outcome of 1 and 2
DO
SKIP
OD

whereby we indicate once again that Algol 68 is a tragically under-used advance over its contemporary and more recent competitors in the field of procedural programming languages.

MARK GREGORY
Leeds LS16 7DB.

'Headhunters'

ALAN Williams (Salesbit on Headhunters), thinks that search methods are fine for top executive positions but not for lower ones. What snobbery. That's a real world out there, not the playing fields of Eton.

Mr Williams seems to feel that there should be some kind of rule book for recruitment agencies. I have news for him, there is. Most of us conduct ourselves ethically and adhere to a strict code of conduct.

There is nothing wrong in presenting a legitimate opportunity to a prospect who fits the profile of what the client company wants. The prospect can always say no.

ROBERT DENENBERG
Senior managing consultant
Overseas Recruitment
London WC2

British micro

I NOTE you refer to only three British manufacturers in your list of Central Computer and Telecommunications Agency approved microcomputers (CW, February 18).

Our Equinox 200-32, which is on the CCTA list, is a British designed and built machine.

M. S. KUSUMIRAK
Director
Equinox Computer Systems Ltd
London BC2.

MMS General Ledger from Software International was developed and installed by PPL in 1974 and we currently have over 45 ICL installations in the UK, plus more than 40 overseas.

IAN PARKER
Managing director
PPL-MMS Ltd
London, SE1.

Hamilton Rentals Limited
Hamilton House, North Circular Road, London NW10 7UB
London 01-981 6777
Birmingham 021-236 3581
Manchester 061-848 8338/8434

Central Scotland 0501 43182
Aberdeen 0224-25301

Chad

Chad

Chad

A book to be published next month, listing available contractors has angered the agencies . . . This week we ask why

Agencies upset over direct recruitment bid

AN attack is being made on the agencies which so far have dominated the contract programming market. It comes in the form of a directory, which will publish the names, addresses and career details of people who at the time of publishing were available for contract.

Interested companies would take out a subscription for the directory, approach potential contractors, arrange interviews, and negotiate terms directly — thereby eliminating the agency's cut, which is typically 25 to 30 per cent of the company's fee. This could be shared between the contractor and the company.

At least this is what the directory's publisher, London-based DP Recruitment Ltd (DPRL) would have us believe. The ques-

tion is, will it work? Will it force co-existence with the agencies? Or will the agencies quickly be forgotten when companies fail to take out subscriptions?

The answer depends directly on the response from interested companies, and indirectly on contractors sending in their CVs. Since the latter have only the cost of a stamp to lose, that would seem to cause no problems.

Yet the first advertisement for the directory, called NCCD, for National Computer Contract Directory, was pitched at the contractor.

DPRL was aiming to have details of 1,500 contractors in the first edition of the directory, due for publication in April.

In fact, DPRL has done better than this. "Already we have had



NORRIS (left) and NICHOLLS of Computastaff . . . Sceptical that companies will take on the donkey work

2,164 replies to our initial advertisement," says Thomas Kaye, a director of DPRL, who adds that at this rate he will have every contractor in Britain on his books by Easter.

The contractor may have nothing to lose by submitting a CV to the directory, but what of companies used to letting an agent find them suitable temporary staff?

They will not be so keen, say the agencies. There will be more work involved in finding the right

people, and maybe no actual savings at all. "What most systems managers want is to be given the CVs of just a few suitable contractors who really want the job," says Alan Norris, chairman of London-based recruitment agency Computastaff.

Norris points out that a company setting out to hire contractors from the directory would probably have to make dozens of phone calls to people who have already found work, or who just don't just want the particular job. In other words, the donkey work usually done by the agency itself.

Another large agency, KPG Computer Support, with offices in a converted cottage in Richmond, believes that most companies value a personal service too much to risk taking people from a directory. "We make more effort interviewing prospective contractors than our competitors," claims KPG managing director Brian White.

KPG's manager of systems programming, Frank Swift, who was hired partly to implement this "stiff interview" policy, makes the same point more strongly. "Some big and small agencies are no more than photocopying units," he snarls, while declining to name names.

Of the agencies Computer Weekly spoke to, only the London-based VLI Group said it might consider offering a rival service. "We are watching the contractors directory scene

closely," says VLI marketing director Anthony Lambie.

The first advertisement for NCCD in Computer Weekly, February 18, angered some of the agencies. They felt it gave the false impression that contractors who establish limited companies and still find work through agencies will have 30% of their income deducted from April 1982.

The offending sentence was: "It now appears certain that, from April 5, 1982, those contracting companies who find work through agencies will have 30% of their income deducted."

The Treasury has made it clear that no such legislation will take effect this April. There may be legislation in the future, but probably not before next year.

Kaye defends the wording saying that it was merely meant to warn people of possible legislation some time this year, and not to create a sudden panic.

Yet there is at least one contractor who claims to have replied to the advertisement through fear of possible tax changes.

Keith Rolley went contract as an analyst last year, working for an agency called Span. "I was worried at the possible loss of 30% because of the cash flow problems it would cause," he says. "I just couldn't afford to lose that money."

A contractor who put details up to NCCD for a different reason is Andrew Ballantine, a specialist in PDP operating systems. "I think the directory is a good idea because the agencies take too much of the cake," he says.

But Ballantine's main reason for wanting to be listed in the directory is the free publicity. "Work has been thin on the ground because not enough people know about me," he laments.

Whether many companies will take the directory remains to be seen, but Kaye claims that DPRL has already heard from many interested firms.

"There will continue to be a place for those agencies who provide a valid service and we aim only at companies who want to take on staff from a directory," he says.

It is a pity that the directory's inaugural advertisement should, for all its gloss, contain a few slips of the pen.

One glaring error was the omission from the contractor's application form of a request for one vital piece of information — the telephone number.

Why software testing is lagging behind

IT is possibly an inevitable consequence of human nature that software testing is the least advanced branch of system development.

Since most analysts would agree that testing consumes half of total development time, why else is it lagging behind? Certainly not through a lack of techniques.

In theory, any program can be proved mathematically correct by analysing every possible pathway, although this is not practical for large interactive systems. But a number of common sense methods can be applied to simplify testing and minimise the risk of embarrassing bugs being exposed at a late stage when their elimination is more costly.

Common recommendations include liberal printout of intermediate results of program execution, at the development stage, constant checks of outputs from standard test sets, and the searching examination of boundary values.

So-called "off by one errors" are a constant source of crashes, and are not always easy to find.

But a slightly more contentious recommendation is making the testers independent of the designers and coders.

It is human nature not to spot one's own mistakes, but employ-

ing an independent testing team is expensive and often counter-productive.

In an ideal world, all code would be read by someone who has not been involved with the project, but not with the code itself, or by someone independent of the whole project.

But as for the overall test for a test there is not always a need for a special testing group. So long as established techniques are religiously applied, it can be carried out well enough by the development team.

Their intricate knowledge of the code can be a bonus as well as a hindrance.

PUZZLER

PPP
PP x
PPPP
PPPP
PPPP

ALL 18 numbers in this multiplication sum are Prime (2, 3, 5, 7). Can you work out the individual identities? See page 47 for solution.

by Andrew Thomas

OP SPOT

Increased performance and cost-cuts could soon make night and weekend jobs a thing of the past

Operators face a shift to 9-to-5 working

ONCE upon a time, machines were very expensive and to recoup the enormous capital outlay companies running computers were obliged to get the most out of them. This meant keeping the beasts running long after all self-respecting people had gone home.

All through the night they ran, tirelessly crunching numbers as their masters slept. But someone was required to watch over them at all times.

And so it was that computer operators came into being, to ensure that all went well in the small hours. Because of the unsocial hours additional remuneration was offered, in the form of shift allowances.

These allowances raised salaries to the point where operating became one of the highest paid jobs an unqualified person could find, with excellent prospects for promotion and career advancement.

Second and third generation computers were not only expensive, but required constant engineering attention if they were to be kept running. Twenty-four hours, seven days a week cover could be provided by the manufacturers at a price which appeared low in comparison with the cost of the hardware.

But massive reductions in the cost of hardware in recent times has meant that the need to bring every last ounce of performance out of computers has reduced dramatically.

Suddenly, computer users are realising that with the increased performance and reduced capital outlay, today's machines do not have to be run all day and every day. The time is fast approaching when, cheap, powerful machines will be run only between nine and five. Evening, night, and weekend working will become a thing of the past.

A senior field engineer told me this week that the number of sites serviced on a three-shift basis is rapidly declining, and that two-shift engineering cover is also becoming rarer.

The trend now is for prime shift cover only, without even the benefit of telephone standby at other times.

To illustrate his point he told me that his company's small mainframe was now priced to be competitive with the additional charge for evening, night and weekend cover. In other words, it is cheaper for an installation with one of these machines to buy another and to forgo running two or three shifts and providing engineering cover for them.

This has an obvious and significant effect on operations staff. Running two machines on one shift does not require double the number of operators, as does two-shift working on a single processor. If there are currently two or three shifts employed, and the management brings in another processor, someone will become redundant.

Checking within ICL revealed a definite trend towards prime shift-only working, as reflected by its maintenance contracts with customer sites. A spokesman said that, at present, the change is apparent at the smaller end of the market, among the System 25s and similar hardware.

ICL is encouraging customers to buy more hardware and less support. The company now offers engineering cover on a two days a week basis, which both ICL and its customers consider a step in the right direction.

Although it is the small systems which are showing the trend at the moment, it can only be a matter of time before large mainframes are affected.

I would be interested to hear from those whose site has changed, or is in the process of changing, its shift system. Perhaps overtime is more infrequent now or engineering cover is not available at weekends. Perhaps that new processor doesn't mean extra work or job security.

Look out for the signs of approaching loss of shift allowance — or even your job.

'Everybody out' when new boss arrived

by Andrew Thomas
A CERTAIN British computer manufacturer decided that it was time to inject some new blood into its customer engineering division, and obtained the services of a customer services manager from a very large American computer manufacturer.

Here was a man with experience of field engineering in the white heat of transatlantic technical know-how. If anyone could inject some dynamism into the UK engineers, this was the man.

Unfortunately, the initial impression created by the new chief engineer proved to be somewhat less impressive than his employers might have hoped.

On the tour of his new empire to inspect the troops, he burst dynamically into an engineers' room at a major site. In a room with accommodation for eight engineers, he found but one, quietly crunching up with a large pile of fault reports.

"Where the hell is everyone? Why aren't they in here working?" demanded the expert from over the pond.

"They're all out at customer sites working," they only come in

here when there's nothing to do," replied the puzzled engineer.

"Ah, silly of me," said the manager sheepishly, "I'm used to an office environment where people not being at their desks means no work's being done."

"I see," replied the engineer condescendingly, wondering just how much knowledge of field engineering his new master actually possessed.

The engineer's thoughts were given more food by the announcement some days later of monthly meetings involving all field engineers being called in to a central location to discuss any problems encountered, and to find solutions to them.

A laudable aim it would seem, but at least one engineer could see arising a problem which could take some solving, given the present incumbent of the management position.

"How am I going to explain to a customer that I can't fix his machine because I've got to go to a staff meeting?"

Perhaps operations managers will be investing in chains and padlocks to ensure that, once they get an engineer on site, they can keep him there.



Will operators' chairs soon be occupied only during the day shift?

Give all programs a jobname

by Colin O'Keefe

IBM-compatible machines must meet very tight constraints before they are acceptable on the open market. For example, machines of the System 370 class must be fully compatible in all areas of operation, except for three types of programs: Model-dependent programs; time-dependent programs; and programs which cause deliberate machine checks.

While the first two are unlikely in concern an operator, the third type is often written as part of a maintenance suite, and would therefore be under the jurisdiction of the operator in charge.

This suite could easily be run on new hardware for which it was not designed, and could as a result produce a meaningless output.

To prevent this, it would be a good idea to give all programs designed for a specific model number a jobname containing that number, so that when a new machine is installed, maintenance suites can be updated accordingly.



The Specialist Event for Specialist Computer Purchasers

Peripherals '82 will feature the very latest in terminals, VDUs, printers, plotters, memory products, graphic displays, tape and disc drives — an exhibition for anyone with purchasing responsibility in the computer peripherals field. This professional exhibition — presented by the **Peripherals Suppliers Association** and Systems International — is the annual opportunity for those requiring computer peripherals to discuss their needs with specialist suppliers.

March 31 — April 2, 1982
10.00 — 17.30 (closing at 16.00 on the last day)
West Centre Hotel, Lillie Road, London SW6

Admission, by business registration, is free of charge. Plan your visit now and save time on arrival by sending for your registration leaflet in advance.

Please send copy/copies of the Peripherals '82 visitor registration leaflet(s) to:

Name
Company
Address

Post to: The Exhibition Manager, Peripherals '82, IPC Exhibitions Ltd., Surrey House, 1 Throley Way, Sutton, Surrey SM1 4QQ.

Announcing . . .

COMPEC SCOTLAND

... Scotland's own professional computer show.

The highly successful Compec exhibition of computers, systems, peripherals and software is to be held in Scotland for the first time this year.

Compec Scotland in Glasgow between September 7-9, 1982 will allow companies selling into this important market to focus on computer users throughout the country.

Surveys of visitors to computer exhibitions demonstrate that users prefer to attend a show which is local to them. Compec North was enthusiastically welcomed in Manchester last year, and has expanded for the 1982 event in June.

Now Compec Scotland with a venue in the centre of Glasgow ensures a place at the heart of another key market.

For information about exhibiting at Compec Scotland contact Chris Timmins, Executive Director, IPC Exhibitions on 01-643 8040 Ext 4869. Or clip the coupon.

Another successful Computer Weekly show.

Please send me details of exhibiting at Compec Scotland.

Name
Job title
Company
Address

Signed

Return to: Chris Timmins, Executive Director, IPC Exhibitions, Surrey House, 1 Throley Way, Sutton, Surrey SM1 4QQ.

Managing director for micro supplier

BUSINESS microcomputer supplier Micro Networks has appointed Bernd Lissok, formerly finance manager with a combustion company, as managing director. He will be based at the company's Pall Mall premises.

Lissok joins the company from East Hill Mill, where he was responsible for managing the design, building and staffing of an entertainment complex, worth £1 million, at Ashford, Kent.



Derek Beon has joined Altek Microcomponents as Southern area sales manager. Beon formed his own company, Stogate Technical Developments in 1970, which later merged with Computing Techniques to form Monolog Systems. He has also worked as a technician at the University of London.

Roger Crumpton has joined Westward Micro Systems as sales manager for the company's new sales operation. The company now sells direct to OEMs and end users, rather than through distributors. Crumpton was formerly Northern region sales manager of Terminal Display Systems based in Blackburn, Lancs.

Hans Hawk-Rogers, former technical director of BMG Microsystems, has joined Farnborough-based Clearsons, as director. His appointment of Clearsons will strengthen the company's sales team selling to the OEM market. Clearsons has recently opened a cash and carry computer and WP supplies store in Hampshire.

Peter Townsend has joined GACI International as a consultant, specialising in database design, data analysis and data dictionary. He will also help to develop the company's training programme on Oracle, the relational database management system for which GACI has the sole UK marketing rights.

Hardware boss

ENCOTEL Systems, a UK distributor of the Superbrain mini-computer, has appointed John Burch as hardware support manager. He will be responsible for the company's new engineering facility at Croydon and will have nine engineers reporting to him. Before joining the company he worked on GEC's System X, Redifusion's VCR, Prestel and teletext services at GEC and Redifusion.

Alan Salter has joined R&H Systems as regional sales manager for the East and South-east. He was previously with Terminal Display Systems. Peter Kerrigan is pre- and post-sales support engineer. He was formerly with R&H's engineering service group. Joining the company as sales co-ordinator is Paul West, who received his electronics and computer training with the RAF.

Micbael Doherty, formerly marketing manager with DLA Computers has joined ISG Data Sales as terminal product manager for the Qume range of terminals.

Stewart Shine and **Richard White** have joined P&O Computer Services' consultancy division. Shine, who joins as senior consultant, has been a programmer, analyst and project leader. White was previously with Data General.

DMcan Dempster Smith has been appointed microcomputer OEM, where he managed the implementation of business systems applications in London and the Home Counties.

Bob Randle has been appointed marketing manager at Compex Computer Services. He previously held senior sales position with BOC and Hoskins.

Peter Cowan has been promoted to international sales manager from UK sales manager at Micro Consultants.

DIARY

MARCH 15
North Atlantic air traffic control. BCS Glasgow branch. The Music Room, Staff Club, University of Strathclyde, John Street, Glasgow. 7.00.

MARCH 16
Word processing and information retrieval. BCS Word Processing/Information Retrieval and Office Automation Groups. Details from Steve Pollitt on (0484) 2248 ext. 2248.

MARCH 17
A director's view of microprocessors. Joint meeting of BCS Birmingham branch and Institute of Internal Auditors. West Midlands County Hall, City Centre, Birmingham. 6.30.

MARCH 18
Meeting of the Committee for the Disabled. BCS. BCS HQ, Mansfield Street, London. 5.00.

MARCH 19
System X. BCS Edinburgh branch. Mountbatten Building, Heriot-Watt University, Grassmarket, Edinburgh. 6.00.

MARCH 20
Computer mail in the automated office. IBE. IBE, Savoy Place, 2 Savoy Hill, London. Details in 01-240 1871.

MARCH 21
User interface techniques. BCS Kingston branch. Kingston Polytechnic, Penrhyn Road, Kingston-upon-Thames, Surrey. 7.30.

MARCH 22
Privacy. BCS Manchester branch. Manchester Business School, Booth Street West, Manchester. 6.45.

MARCH 23
Pascal: Son of Algol. Mother of Ada. BCS Preston and District.

MARCH 24
Presentation by R. B. Barnes, general manager, Computer Group CWS. IDPM North-Western branch. New Century House, Corporation Street, Manchester. 6.30.

MARCH 25
Annual General Meeting. IDPM Norfolk branch. Castle Hotel, Norfolk. 7.45.

MARCH 26
Communications between users and computer people. Joint meeting of IDPM Kent branch and Chartered Institute of Secretaries. Oak Room, Royal Star Hotel, Maidstone. 7.30.

APRIL 15
Meeting of IBM Guide SET group, re-scheduled from January 14. IBM, Wigmore Street, London W1.

Do you use UNIX* or any Unix-based or Unix-like system?
You may be interested in the European Unix User Group

Our next meeting will be held in Paris where we shall also be holding an Open Meeting. At this time the major vendors of Unix and Unix-like systems will be exhibiting and giving presentations on their products. For further information on membership of the EUUG contact:

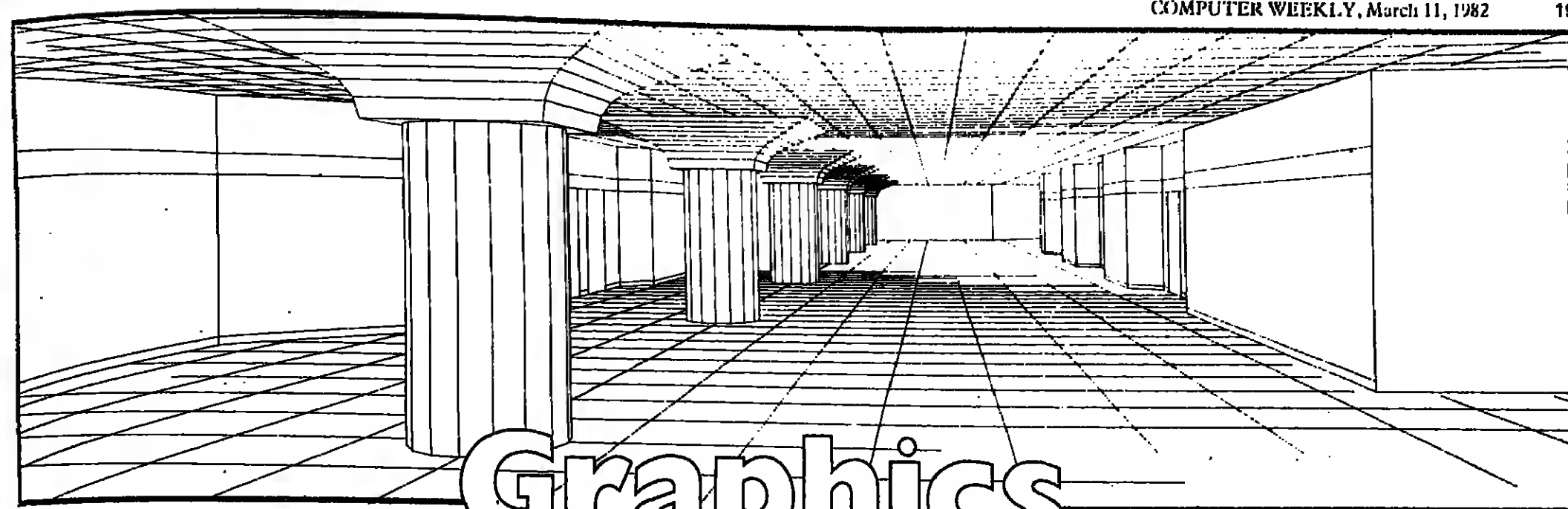
Hugh Corbett
EUUG Membership Secretary
Department of Electrical and Electronic Engineering
Heriot-Watt University
Mountbatten Building
21-25 Grassmarket
Edinburgh EH1 1HT
Scotland

and for details of the meetings

Open Meeting - April 14th
on Paris
Group Information
15-16 Rue de la Chapelle
75010 Paris
France

Members Meeting - April 15th/16th
Black and White
Laboratoire d'Informatique
CNRS
202 Rue St. Martin
75141 Paris
France

*UNIX is a trademark of Bell Laboratories



Graphics

European market is heading for \$3 billion image by 1990

by Boris Sedacca
IMAGES have been used to represent concepts from the beginning of time itself. The paintings of cave men attempted to communicate more than just the intrinsic images of men chasing animals with spears.

With computer graphics only the tools have changed, but the basic principle remains. Early man soon found that iconic images those which represent the physical forms of objects - had limited application.

So where trade needed to be recorded, there had to be a better way of showing, say 20 bags of grain, than by laboriously drawing each one. Conceptual symbols served the purpose better, and numerical systems were born.

Today, a company executive uses graphics to represent his boss of some ambitious plans without boring him with confusing detail.

Vendors of graphics equipment want to a very down-to-earth speech to sell their kit. Graphics, they say, saves time and money, improves decision-making, boosts productivity, makes companies more competitive, reduces errors, provides insight into complex problems, and so on.

Even the present government, widely considered more tight-fisted than previous administrations, is to spend £9 million in one specific area, printed circuit design, just to convince smaller companies of the arguments for using computer graphics. It has also earmarked £5 million for a similar "awareness" programme in computer-aided design/computer-aided manufacturing (CAD/CAM).

Cited productivity as its rationale, the government plans to hold its first seminar in June, with the first course beginning in September. Some proponents of the scheme claim that five-fold productivity improvement can be achieved with the use of CAD.

But according to another school of thought, it is the basic tools themselves which are capable of

absorbing such an increase in productivity, not necessarily the engineer. The engineer gets insight into complex problems by exposure to detail, not by pressing a button to automate tedious tasks.

Nevertheless, the productivity theory will prevail and market research organisations are predicting an ever-booming industry for vendors of computer graphics equipment. This is borne out by evidence from an exhibition to be held in Brighton at the end of this month, CAD82, where the number of exhibitors has grown from 20 in 1974 to 65 this year.

According to Frost and Sullivan*, turnkey graphics systems from US companies like Computervision, Calma and Applcon show the highest growth potential in the European market with sales increasing at the rate of 30% a year. About 600 systems of this kind have been installed around Europe.

These suppliers are now facing competition in specific market segments such as printed circuit design from indigenous European suppliers like Racal-Redac in the UK and CERCI in France.

Frost and Sullivan predicts a European graphics market of \$3 billion in 1990 from \$290 million in 1979, with industrial applications increasing seven-fold. Sales of graphics equipment to users in business and education will grow, it is forecast, from \$45 million in 1980 to \$500 million in 1990, although the sale of desk-top computers with graphics capabilities confuses the figures.

Three countries - Britain, West Germany and France - represent 85% of the computer graphics equipment in Europe.

Suppliers of graphics software in the UK include Applied Research of Cambridge, the Central Electricity Generating Board, Compendia (a National Research Development Corp subsidiary), Computational Mechanics, the Computer Aided Design Centre in Cambridge, Eclipse Computer Services and the National Engineering Laboratory.

A scattering of UK research academics previously supported by Department of Industry funding will contribute to an average market growth of 30% a year for computer graphics, according to Frost and Sullivan.

In the remainder of Europe, the main suppliers of computer graphics software include CISI and CERCI in France, Institut Battelle in Switzerland, Aristo in Germany and Olivetti in Italy.

In 1985 the use of computers in graphics will have grown only about 10% from 1979 as a base year, whereas dedicated graphics equipment will have grown by about 230% and graphics software by 250%, according to Frost and Sullivan.

The computer graphics market in Europe is estimated at about \$458 million in 1980, of which over 90% was imported from the US, and roughly \$13 million represented exchange between European countries. Computer graphics represented 7% in value of computer imports from the US but there is an increasing trend for exchange between EEC member countries and a relative reduction in imports from the US.

The overall market is expected to grow at 20% over the next five years but from 1985 to 1990 this

simulating results of changes in parameters. They can be provided with management aids for projects in the form of critical path analyses which may be updated at different phases of the project as necessary.

The use of colour may be added to draw attention to significant values to pictures with text and graphics.

Business graphics requires representation of data in two dimensions whereas industrial graphics invariably requires the representation of objects to three. Geometrical aspects have to be shown as well as the representation of the material itself and the state of its surface. This usually calls for large memory capacities.

Despite the embarrassingly disappointing market reaction to Prestel, viewdata is recognised as a cheap method of communicating images and second generation editing terminals are expected to provide more computer graphics facilities to speed up page creation.

Graphics animation will also be used in educational applications, providing the ability to create moving images and cartoons. Business applications will include the ability to visualise numerical data and to transmit graphs and images in office automation. Executives will be able to perform marketing analyses and to examine financial strategies by

*Computer graphics in EEC industrial markets and computer graphics equipment in EEC business markets published in April and December 1981 by Frost and Sullivan, 104-112 Marylebone Lane, London W1.

IT'S NOT JUST THE 1536 x 1024 RESOLUTION THAT MAKES SIGMA'S T5470 THE TOP MONOCHROME GRAPHICS TERMINAL IN THE BUSINESS.



- Fast hardware vector generator
- Polygon fill
- Canics
- Independent multipage text store
- 20" or 15" screen
- Modular configuration for the system builder
- Joystick control
- Hardcopy output
- TEK 4014 emulation
- Designed and manufactured in the UK - Maintained throughout Europe and the USA

Call Sigma now on Harsham (0403) 50445 to discuss your application for the T5470.

Displaying leadership
SIGMA
Electronic Systems

Sigma House,
North Heath Lane,
Harsham,
Sussex RH12 4UZ
Telex: 877937 SIGMA-G

COMPEC NORTH'82

BELLE VUE, MANCHESTER JUNE 22-24, 1982

The exhibition
Compec North was launched in 1981 to serve the computer requirements of end users, the OEM market and other computer companies in the North of England. The exhibition was outstandingly successful, filling the industry's need for a well-organised and well-promoted computer show in that part of the country.

The market
Compec North attracted 4,271 top quality visitors - from an impressive range of organisations, including: Banking, finance and insurance; telecommunications, electronics and engineering; construction, metallurgy and chemicals; printing, research and large retail groups; large manufacturing companies, the major nationalised industries, national and local government establishments; police and the armed forces.

The success
Compec North's combination of content, location and visitor profile guaranteed a hugely successful exhibition for all concerned - strongly confirmed by just some of the exhibitors' comments:

"Provides business for a long time ahead" *Itasca InterSystems (UK) Ltd*

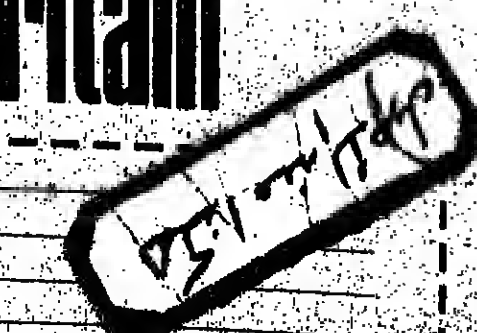
"All the visitors seemed to be real prospects and came from a good geographic spread" *Case (Computer and Systems) Engineering Ltd*

"Well organised, valuable and about time there was a show in the North" *Control Data Ltd*

Return to Exhibition Manager,
Compec North'82, IPC Exhibitions Ltd,
Surrey House, 1 Throby Way, Sutton,
Bury, SM1 4QD
Tel: 01 643 8040 EXT 4893

Please send more details and contact me regarding a stand reservation

A major computer show at the centre of industrial Britain



Name _____
Company _____
Address _____
Tel No _____

Graphics has become an essential tool for those controlling company finance . . . David Casey reports

A good picture is worth a thousand words when passing on information

NEWSPAPER journalists are well aware that a good picture is worth a thousand words.

No less important is the information content communicated through a video display — an electronic blackboard which has pervaded every sector of the business community during the past five years. In many corporate finance departments, the screen has replaced the printed page as the first contact with statistical and financial information; a hard copy is extracted from the computer only for longer term reference.

Down on the shop floor, progress is monitored on VDUs, a medium well able to handle production information which is constantly changing.

Systems able to mould raw statistical information into a graphic display are not a new development, however. In the field of computer-aided design, terminals which can interpret arrays of mathematical equations as three-dimensional representations on the screen have helped to simplify complex engineering projects.

Integrated circuit design, a process which evolved from the layout of printed circuit boards, owes much to the interactive capabilities of computer graphics.

Growth in the computer graphics sector will be focused on two market areas during the next five years. The small design team is a prime target for system suppliers currently experiencing resistance to CAD equipment priced at £100,000 or more. Computervision, a company which has dominated European CAD sales since the early 1970s, recently introduced the Designer M series specifically for this smaller scale user.

A feature now available on the Computervision systems is three-dimensional "solid modelling", in

which the 3D framework normally associated with CAD graphics is replaced by a more realistic representation.

With trends in management towards the greater disclosure of information computer graphics will help provide an interface between contrasting disciplines. From their professional training, the account-

With trends in management towards the greater disclosure of information, computer graphics will help provide an interface between contrasting disciplines

ants in an organisation are able to gauge a company's performance using only a handful of key financial statistics.

Communicating the same information to technical personnel or trades union representatives requires a very different approach: no less thorough, but with the data presented in a more palatable form.

If employed only as a medium for translating data from narrative to a pictorial form, "computer graphics" systems are a one-directional channel of communication. The flow of information is from the computer to the observer, with little opportunity for interaction between the two.

There is an increasing range of applications where the graphics must respond rapidly to changes in the data being displayed. Corporate financial modelling is an

example of how computer graphics can add an extra dimension to a conventional planning technique in that the effect of proposed changes in a strategy may be monitored with the maximum visual impact.

From raw data entered through a series of prompt statements, a static model of a company is developed as the first step. The critical factor, cash flow, is budgeted for future trading periods; the timescale of the forecast being determined by the availability of accurate information.

The model of the company which evolves is expressed as successive columns of data representing weekly or monthly cash movements. At best, the table is a projection of a business based on a single set of inputs.

Modifying any of the key parameters of the business on a "what if?" basis generates a revised model which may differ from the first approximation in only a few of the component figures: the impact of these variations may be apparent only to the trained financial eye. Interpreting the same models on a graphics display terminal will highlight changes for management whose role it is to appreciate corporate performance without having to understand the accounting principles involved.

By basing hardware design on conventional terminals wherever possible, manufacturers have been able to bring full graphics capabilities within the scope of the smaller business market. On its HP125 Business Assistant, Hewlett-Packard has introduced colour graphics as a standard feature. Controlled through means of options, the Graphics/125 software interacts with other packages — including word processing and Basic — running on the same system.

Since the interactive financial modelling system Visicalc is also supported by the HP125, it follows that trial models of a company can be converted into pie charts, several types of bar chart, or conventional X-Y graphs. Outputting the contents of the screen to a multi-colour plotter produces either a hard copy on paper, or a transparency for overhead projection.

With the enormous potential of its minicomputer user base to be tapped (there are an estimated 12,000 PDP-11 systems in the UK alone), Digital Equipment has introduced a range of graphics terminals. The VT125, for example, is a model in the VT100 series, which supports DEC's Remote Graphics Instruction Set (RGIS). But the specialised graphics software for the VT125 can be used to upgrade an existing VT100 terminal, providing a relatively low-cost introduction to the technique.

Designed primarily for the educational and smaller business markets, the GIGI graphics terminal from DEC uses the same RGIS software as the VT125, and supports a version of Basic for manipulating graphic symbols on the display. For integrating text with graphics, the DEC-RTB package on the system provides text input and editing facilities.

Aiming at a similar user base the DEC VT125 produces a Data General's Dasher D280C colour terminal. Compatible with the manufacturer's D100 and D200 terminals, the colour unit would be used in business applications where the creation of multi-coloured charts could improve communications.

The isolation of business graphics as a definable market sector is accounting for an increasing share of the turnover of suppliers normally associated with engineering



The effect of proposed changes in company strategy may be monitored with relative ease.

design systems. Calcomp is currently placing 30% of its small plotters in commercial applications as diverse as market research (National Opinion Polls), strategic planning (Gallahers) and commodity broking.

The introduction of microcomputers with an inherent graphics capability will do much to promote sales of the cheaper graphics plotters. Calcomp software has been

The more familiar that a businessman becomes with the applications of the technique, the greater is the likelihood that he will find a need for more sophisticated systems

modified for Apples, for example, with output to a colour plotter. Neil McLeod, the company marketing services manager believes that the "economy" micro provides a valuable, if somewhat restricted, introduction to computer graphics. "The more familiar that a businessman becomes with the applications of the technique, the greater is the likelihood that he will find a need for more sophisticated systems."

McLeod does not see a major market arising however, from the development of networks for micros. "The benefit of having a graphics output device linked to your own terminal is lost if the unit is at a remote point in the network."

While the development of business graphics systems owes much to the work of the CAD manufacturers, the lead in this field has been taken more recently by purpose-built display units. The Comshare Execuchart is a unit designed specifically for the commercial market with the presumption that the user will have little knowledge of computer systems. Able to operate in six graphic modes, the standalone terminal is supplied with a library of charts as an aid to designing meaningful displays. Interaction between the operator and the system is improved using an electronic "mouse" on a desk-top digitiser. This device, rather than a conventional cursor control pad, selects options from menus of commands which appear on the display.

The concept of a free-moving "mouse" on a control surface is also applied by Xerox on the 8010 Star information system, designed as an executive workstation. A Star unit provides a high definition black and white representation of both text and graphics; simulating a printed A4 page.

In the Perg workstation being manufactured and marketed by ICL, a hand-held input control — not dissimilar to the Xerox "mouse" — has replaced the single function graphics pen with which the system was first launched. A single Perg installation is based on a 16-bit CPU with between one-quarter and 1 Mbyte of memory and a 24 Mbyte Winchester.

The standard to which information can be presented on the screen is exceptionally high, and is supported by software which allows



GIGI graphics terminal for the smaller business markets.

Bob Brash compares graphics printers and vector plotters, and looks at some different methods of interfacing them

How to pick the best hard copy method

NO computer graphics system is complete without a plotter. In the same way that a conventional business computer system needs a printer, even for occasional use, only some form of hard copy is needed for graphics images because it is unlikely that terminals will be located wherever reference has to be made to a diagram.

There are basically two distinct ways of producing a graphics display. These are raster and vector. This distinction applies both to visual display units and hard copy units.

For a visual display system the raster output is the most common since most displays have a continuous refresh system. The alternative is a storage tube type of display on which vectors are written and retained by the storage tube memory.

Whichever display is used, the data is originally generated in vector form. However, in the case of a raster display it is written into a memory which is then scanned in raster fashion in sync with the line scan of the cathode ray tube.

Directly analogous to the raster and storage tube CRTs used for visual display are the printer and XY plotter used for hard copy output. A printer is able to take an output from the raster scan memory and reproduce it by scanning the paper and placing dots in the appropriate places to build up a vector pattern. In the case of an XY plotter information is sent in its original form and this is translated into a controlled motion of the pen to produce the required vector on the paper. It is therefore possible to build up a complete graphics picture without having a raster scan type of memory (usually referred to as a bit map memory) to hold each resolution point within the picture area. This is quite important when dealing with high resolution displays, where the amount of memory required for such a bit map becomes very large.

When comparing printer and vector plotters, it is difficult to say that one is better than the other; each has its place for certain applications. As a general rule, one would choose a vector plotter where quality of presentation and accuracy are the most important features and a printer/plotter where speed of output is most important, particularly if there is a lot of alphanumeric data to be recorded within the graphics plot. One would also use a vector plotter in cases where a large scale plot is required.

There are two basic types of vector plotter. First is the flat bed plotter which has a pen or series of pens mounted on a carriage which is driven in two directions over a flat bed. This has the advantage that the whole of the plotting area is visible during the plot and may be observed without removing the paper. Data may be added to the same sheet.

The second type is the drum plotter which is used particularly for very large scale plotting where the sheer size of a flat bed plotter would be undesirable. In this system the paper is moved in one direction by means of a revolving drum and the pen is moved in the other direction. Vector plotters range in size from A4 size (28 cm high) up to A0 size and beyond (120 cm high).

In either of these types of vector plotter the pen, gantry or paper may be moved either by stepper

motors or by analogue DC motors. In each case data is processed digitally and commands are generated in digital form and presented to the motor drive electronics. In the case of the stepper motor these commands are processed digitally and step by step commands are given to the motor.

When a computer converses with an XY plotter, commands are sent to a vector plotter in exactly the same way as one would send a string of characters to a printer; that is using a standard ASCII character set. In order to be able to interpret the characters presented to it a command language is required in which each action or operation of the plotter has a unique command format.

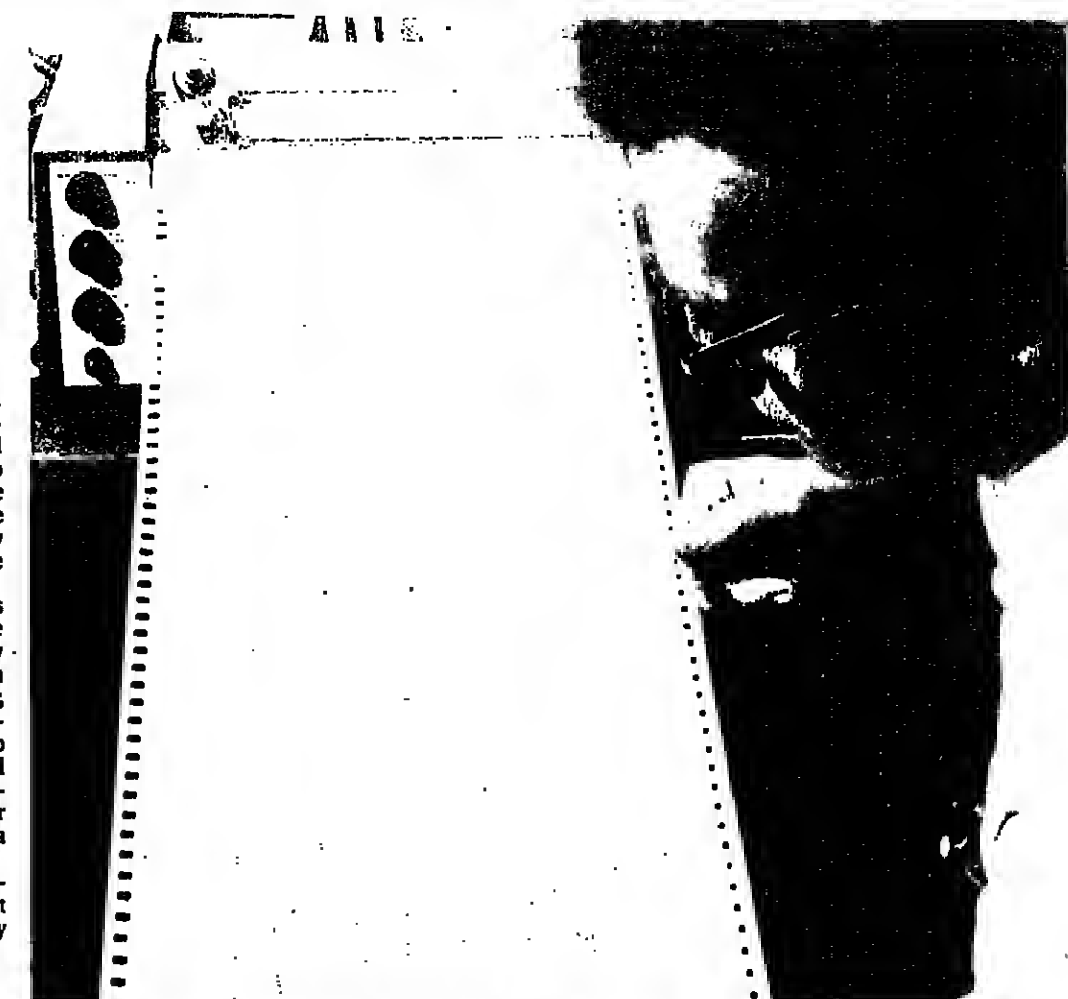
Unfortunately, no standard language for vector plotters has yet emerged and today almost every

Unfortunately no standard language for vector plotters has yet emerged and today almost every plotter on the market has its own different command structure

plotter on the market has its own different command structure. This means that software has to be written for a particular plotter and alterations would generally have to be made to enable it to run on any other plotter, or at least a plotter from another manufacturer.

In addition to the drawing commands a number of other commands are available on most plotters for functions such as scaling, automatic pen changing, automatic advance of the paper where the unit has a chart advance attachment, in-built error checking facilities, and digitising. The digitising function is an interesting and useful feature and one not available on printer plotters.

By means of the digitising controls one is able to move the position of the pen over the plotting surface manually, and to transmit the co-ordinates of any selected point from the vector plotter back to the computer. This has a variety



A vector plotter would be chosen where quality of presentation and accuracy are the most important features.

of uses — for alignment of the paper, for specifying a plotting window which is smaller than the overall plotting area of the plotter, and for identifying a location on the plot; for example where the plotter has previously drawn a map it can identify a particular location and supply the co-ordinates of that location to the computer.

The scaling facility is another important feature which allows the user to redefine the plotting units.

The two most common interfaces used are the RS232 and the IEEE. Nearly all graphics plotters are compatible with one or the other or both these interfaces.

The RS232 is a long established interface used particularly to connect printers and mass storage devices to computers. With the RS232 interface, data is transmitted bit serially and this has the effect of minimising the number of interconnecting wires involved. Data is transmitted at one of several defined bit or baud rates along a single line and similarly received along a second line. These two lines are called the TD and RD lines.

In the simplest configuration it is only necessary to use three wires TD, RD and Ground to connect a plotter to a computer via the RS232 interface. Having made

these connections and provided that the transmission rates are matched between the computer and the plotter, and that some other options are compatible such as word length and parity bits, it will be possible to transmit data from the computer to the vector plotter and similarly when using a digitised function to transmit data from the plotter to the computer.

Provided that the vector plotter has an instruction buffer and the size of the buffer is adequate to

accommodate the largest plot required, then the three connections are all that is required to operate the system satisfactorily.

The IEEE-488 or IEC625 interface is a bit parallel byte serial interface invented in 1975 by Hewlett Packard. It is used particularly in the instrumentation field where a number of instruments are required to exchange data between themselves, and a particular feature of it is that a number of instruments may be connected in

	Graphics Printers	Vector Plotters
Type of paper	Roll	Sheet
Speed (characters)	Fast	Slow
Speed (vectors)	Slow	Fast
Line quality (typical)	Poor	Good
Resolution (typical)	0.25 mm	0.1 mm
Multiple copies	Some	No
Number of colours (typical)	1	6
Digitising	No	Yes
Price (typical)	£1,500	£2,500

Printers v. plotters

parallel on the same bus system. Every system must have a controller and only one controller may be in charge of the flow of data at a given time; usually the bus controller is a computer.

With this interface each of the peripherals on the bus is given a different bus address and is told when to talk and when to listen by the bus controller.

The IEEE specification and the IEC specification are electrically identical but the specification of the interconnecting plugs and sockets are, unfortunately, different.

In comparing the two interfaces one can say that the IEEE interface is generally faster than the RS232 and requires less setting up; the only adjustment possible being selection of the bus address. It does, however, require many more interconnecting lines than the RS232 interface and has a limit on the maximum length of cable over which it will operate of about 20 metres.

Bob Brash is research and development director with Bryans Southern Instruments.

THE T5680

COLOUR GRAPHICS TERMINAL

HIGH ON FEATURES

-LOW ON PRICE

- 768 x 512 resolution
- 4K colour palette
- Fast hardware vector generator
- Polygon fill, pattern or solid
- Conics
- TEK 4010 emulation
- Hardcopy output, colour or monochrome
- Powerful graphics software routines
- 28 programmable keys
- Joystick cursor control
- Independent multipage text store
- Independent or combined pixel store addressing
- Designed and manufactured in the UK — Maintained throughout Europe and the USA.

Call Sigma now on Harsham (0403) 50445 to discuss your application for the T5680, or write to:

Displaying leadership

 Sigma House, North Heath Lane, Harsham, Sussex RH12 4UZ. Telex: 877937 SIGHM-G.

Ireland is straining every nerve, and spending a lot, to attract foreign investment — and succeeding, says Kevin Cahill

Making a blue-chip certainty out of the Emerald Isle . . .



WRIXON . . . Laying the foundations for research in an old maltings.



MULLIGAN . . . DEC is fully committed to its Irish factories.



YAMADA . . . Mixing socially is easy.

THE fastest growing computer industry in the Western world is not to be found in any of the traditionally industrialised countries. It is the place called by poets "the dark edge of Europe", the Irish Republic, where the computer sector is growing at an annual rate of 35%.

Admittedly, the Irish are starting from a very limited base in a country which was, and still is, predominantly agricultural.

But the country is faced by the problem of a huge decline in the labour needs of this sector, and simultaneously, by an unprecedented rise in the population. By the end of the decade, it is expected that over 50% of the work force will be under 25.

In a bid to deal with this crisis the Irish government, and its investment arm the Industrial Development Authority, are spending up to £600 million annually on attracting business.

This ambitious level of investment is being undertaken to give the country a stake in the industry of the future — electronics and computers.

Investment by the IDA mainly takes the form of startup and development grants, but these are minor inducements compared with the 10% tax holiday which will last until the end of the century.

Some companies are still benefiting from an even greater concession, zero tax on manufactured exports. This has now been changed under pressure from the EEC Commission in Brussels, egged on by envious development authority neighbours in EEC states.

But the Irish dodged the EEC's attempt to handicap them by creating a uniform rate of 10% on all Irish goods manufactured for export.

And a careful reading of the fine print in the country's tax laws makes it clear that a combination of capital training and other allowances can effectively bring even the nominal 10% down to zero.

The biggest single investment in the Irish computer industry was made ten years ago by DEC, which started a test and assembly plant in Galway in 1972. This now employs 800 people, although according to Charlie Mulligan, its Irish manager, DEC's original plan was for 600.

Now DEC has two plants in Ireland, both manufacturing processors and VT 100 terminals. These are destined principally for DEC's huge European markets.

The problem of transportation of the products to Europe might be thought to be a serious obstacle, but according to Mulligan, the problem simply does not exist.

"It takes less than 24 hours to get computers to the UK, and most centres in Europe are 48 hours at most from Galway," he says.

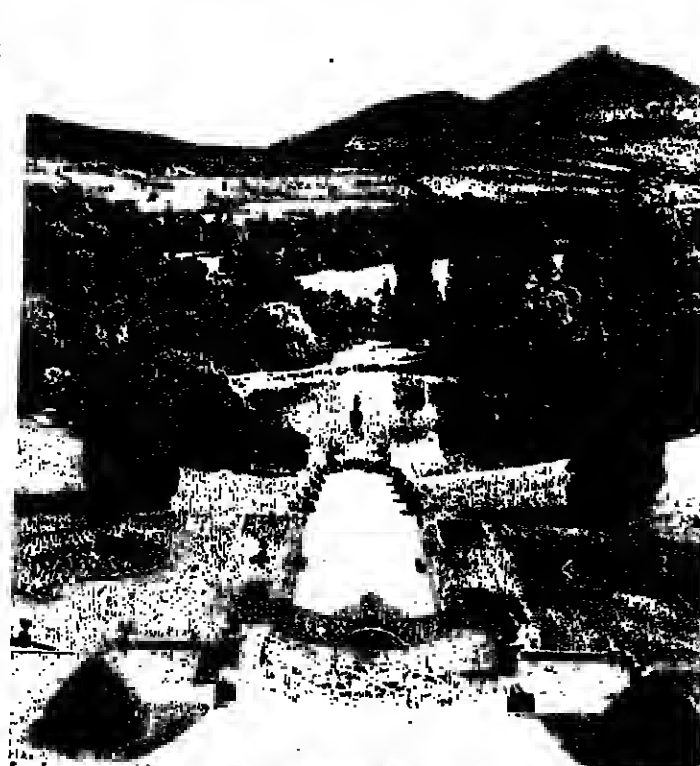
And telecommunications, for long the worst bugbear for all Irish industry, is finally coming right.

Two years ago, the government launched an ambitious £800 million revamp of the country's antiquated and largely manual telephone system.

Most of the new investment has been in the international links and exchanges that companies such as DEC must have, to maintain their online round-the-clock manufacturing systems.

In fact, it was pressure from companies like DEC and Amdahl which led to the changes. Mulligan reckons that it is often easier to get in touch with headquarters, in Boston, now, than with some of his suppliers in remote areas.

DEC in Galway, a relatively remote part of the country, has an annual employee turnover of less than 3%. Mulligan feels that some of this can be attributed to the company's enlightened employment policies, which carry heavy training commitments with them.



Lush countryside and stately homes are all very well, but Ireland needs booming industries to provide for its exploding population.

but the scarcity of jobs in the West of Ireland must also be a factor.

Productivity at the Galway plant is at least as good as in any of the parent's American plants, sometimes better, in Mulligan's view.

However, this problem of productivity is seen in a different light by the Japanese, who have recently begun to invest heavily in plants in Ireland.

The Japanese seem to feel that they are more readily accepted in Ireland than in most other Western countries.

According to Ryosuke Namazu, the manager of Fujitsu's Dublin, based PCB plant, Irish productivity, though good, is not as good as that of the company's plants in Japan.

(But this might be said of many plants in Silicon Valley too, where punctuality and employee turnover are a permanent problem.)

The Fujitsu plant is one of 10 or so Japanese computer and electronics factories which have recently been set up in Ireland.

According to the IDA, the Japanese seem to feel that they are more readily accepted in Ireland than in most other Western countries.

Human resources

THE Irish government has made a massive investment in the key resource needed to sustain a viable computer industry — educated people.

To staff more than 30,000 electronic and computer jobs the IDA hopes to create over the next six years, the country has rapidly expanded all forms of third-level (degree and HND standard) education. Institutes of Higher Education have been set up in Limerick, Cork and Dublin.

The University of Cork has created a microelectronics research centre which can offer 25 to 30 postgraduate places, each year in each of the key micro technologies: gallium arsenide, CMOS, thin and thick film, and Josephson junction research.

The new microelectronics centre is being built with American type speed and enthusiasm by Professor Gerry Wrixon. Standing among the pillars of concrete which are rising in an old maltings on the banks of the River Lee, Wrixon says that the centre offers more scope than almost any other European centre for microelectronics research.

He is optimistic about the success of the current IDA policy of giving emphasis to the "full facilities" grants, which include generous encouragement to incoming companies to set up R&D facilities at their Irish plants.

Already Wrixon has completed work with Advanced Micro Development, an American company, which has begun full chip production at its Limerick plant.

concentrating on test and assembly plants to feed American and Japanese products into the EEC, duty free.

The authority's biggest recent coup was the capture of Gene Amdahl's Trilogy.

This company, to which the IDA has committed over £9 million in grants and aid, is setting up its principal manufacturing plant in Ireland.

From the plant, which is expected to be in production and employing about 600 people by 1984, will come a new breed of general purpose mainframe with a performance rating of around 45 million instructions per second.

To produce the first of these machines, Amdahl and his partners, including the IDA, will have spent more than the UK government did on the whole De Lorean car plant in Belfast.

Much of Ireland's success in attracting investment is attributed to the fact that the IDA is a "one-stop shop".

David O'Donovan, the IDA's director in the UK, says that most companies planning to set up away from their home base want to avoid having to deal with a range of local, regional and national authorities in order to get their factories operational.

"The IDA long ago organised itself so that it can provide, within its own resources, all the contacts any company is likely to need in order to start operations."

O'Donovan also points out that the rate of return on investment in Ireland is double the EEC average, according to the US Department of Commerce.

The average rate of return on investment in Ireland is 33.7%, compared with 16.8% for the rest of the EEC. And this means that a company can recover the full cost of its investment in three years.

The US has probably now overtaken all other countries as the largest foreign investor in computer facilities in the Republic. Apart from IBM, almost all major US manufacturers have plant in Ireland, although the Japanese came a close second to the Americans.

One of the reasons quoted for the IDA's success in persuading the Japanese to come to Ireland is the strong presence the organisation has maintained in Tokyo. It arrived there before most other countries saw the benefits of attracting foreign investment.

One of the UK development authority's Tokyo staff recently commented that before a Japanese computer company finished thinking about a new project, someone had told the IDA staff in Tokyo.

Jim Cashman, who has headed the IDA presence there for 20 years, says that the IDA are simply better organised than other agencies.

Cashman, who speaks Japanese, also says that patience is very important when dealing with Japanese businessmen. It is true that he has plenty of it, and the payoff is well in evidence.

Ten Japanese companies, seven of them from the computer industry, now have plants in Ireland. They are to be joined by an eighth, Logic Systems, a small but rapidly growing micro builder.

Although it is never openly discussed, part of the motivation for the Japanese does spring from the threat of European protectionism. But in their view Europe is as important as the US, and also less difficult to enter.

For the Americans the problem is very much simpler, and some of them are even of Irish extraction. But the noticeable feature of the new Irish computer industry is the number of US companies headed by local Irish managers.

The Japanese, on the other hand, seem to prefer to keep a Japanese presence at the top.

Experienced software staff at a quarter the price are available in some Third World countries, says Ian Palmer

NO DP manager needs reminding of the ever increasing costs of his staff. Hardware costs may be plunging but salaries, fringe benefits, national insurance, pensions and other people related costs continue to grow.

Many solutions are being tried to attempt to resolve this problem. Fourth generation languages such as SQL, ADF and focus are beginning to produce large productivity gains. Structured analysis, design and programming techniques are leading to smoother development projects and reduced systems maintenance. Data administration together with the use of a DBMS does eliminate much duplication of effort.

But for all this, the application backlog remains, and users are tempted into trying to do their own thing on a mini or micro, and people costs steadily climb.

Non-procedural languages and system building by end users may well be the answer in the long term. To make an immediate impact, at least on the programming backlog, there is an alternative strategy: send the work to where costs are substantially lower and quality people are available.

In several Third World countries where labour costs are a quarter European rates, there is a substantial pool of under-employed university graduates.

The idea is not new. Large volume data preparation jobs have been exported to such countries as Taiwan and the Philippines for many years.

A good example of the arm's-length production of software has been the co-operation between Burroughs and Tata, India's largest industrial firm, which now has a substantial software subsidiary.

Not all programming projects are suited to being handled in this way. The criteria for program coding to be handled remotely must be considered.

1. The system design and specifications must have been fully related and approved by user management. Interaction should not be necessary between end user and program coder, as this is clearly not practical.

2. The program structure, design and specifications must be rigorous and complete. In other words there should be no scope for imagination or initiative on the part of the program coder.

3. The strategy for program and system testing must be clearly laid out, and carefully designed test data supplied.

These principles imply a clear separation of design (the architect's role) from coding (the task of the construction worker). They imply standard management approval stages and quality control. They certainly imply a clear analysis and design methodology, with good documentation standards.

The objective of these criteria is to minimise communication between the design team and the construction team. But even with the best methodologies and diagrammatic techniques no specification can be proved to be watertight.

Project organisation should allow for one of the head designers to spend some time with the coding team, ensuring that there is no miscommunication in the specification. This is best done after the coders have had a few weeks to study the specifications and to organise the sharing of the work between the members of the team.

A comparison of four low-cost countries

	INDIA	MALAYSIA	PHILIPPINES	SRI LANKA
Programmer's monthly wage	\$225	\$800	\$450	?
Computer installations	900	272	415	32
Software houses	?	15	23	2
Computer bureaux	?	10	28	2
Availability of staff	good	competitive	limited	need training
Income tax on foreign investors	7.5% for 5 years	0% for 8 years	0% for 10 years	0% for 25 years
Major foreign influences	British & Russian	British & American	American	British

Figure 1. Factors in establishing a software factory.



Computing in the Third World. This Seecheck installation is at Petroleum Development (Oman) Ltd in Muscat.

Programming at arm's length, or how to slash people costs

London or some other convenient centre?

5. Infrastructure and business facilities. Is the location geared to multinational companies with adequate office accommodation, banking, electricity supply, water supply, security, etc?

6. Quality of life factors. Is the location well served for transport, personal accommodation, shopping, recreation, or will there be difficulty in attracting staff, particularly management staff, from Europe?

7. Political stability and maturity. If a long-term view is being taken, does the country have a stable government with the prosperity of the people on the increase, or is it riddled with bureaucracy, corruption and hostility?

Among the countries worth considering are India, Sri Lanka, Malaysia, Thailand, the Philippines, Taiwan and South Korea. Figure 2 provides some comparisons for four countries I have studied personally.

Singapore is not included; labour costs are already too high. The availability of experienced DP professionals is highest in India. India and Sri Lanka both produce large numbers of graduates, who do not find it easy to obtain employment matching their intellectual ability.

Note that in establishing a software factory where the emphasis is not to be on coding and certainly not on imaginative design, it may well be best to train recent graduates around the methodology and standards to be used, rather than attempting to retain more experienced programmers.

It was in the Philippines that I found the greatest enthusiasm for participating in foreign programming projects. For example, one of the largest software houses and

computer bureaux in Manila (with some 300 staff), is keen to participate in software product development, offering to share the investment by undertaking the coding and testing at no cost in return for a royalty on eventual sales. Another is able to undertake programming projects at a fixed price, but this is based on costings of less than \$70 per day.

A bonus is provided by the government incentives offered to encourage Western companies to introduce their skills and to provide employment. In Singapore incentives have gone so far as to include a 70% subsidy on fees paid for training seminars, and even a similar subsidy on consultancy projects.

Most other countries have a zero or very low corporate tax rate for the early years in the life of a

foreign subsidiary. Most have a duty-free zone where industries can be established; all necessary equipment, such as computers, imported free of tax; modern accommodation and services supplied; and where, in theory at least, red tape is cut to a minimum.

The Santa Cruz Electronics Export Processing zone near Bombay is one of the longest established. (Figure 1 assumes use of SBEPZ facilities). Other zones include Bataan in the Philippines and a newer site near Colombo in Sri Lanka.

Ian Palmer is an independent consultant and co-author of Computer Weekly's successful Data Analysis series, now available in book form.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Figure 2. Factors in establishing a software factory.

Programming costs in India

(Dollars per annum)

Labour Costs:	
Basic Salary	2,700
Accomm.	900
Allowance	150
Medical	230
Vacation	150
Travel Allowance	270
Retirement Fund	400
Training	—
Total	4,800

Overheads (shared between 30 programmers):	
Management Costs	930
Admin. Staff	620
Accommodation	700
Services	760
Supplies	330
Telecommunications	830
Total	4,070

Annual Cost per Programmer	\$8,870
Daily Cost	\$38.50

Figure 1.

foreign subsidiary. Most have a duty-free zone where industries can be established; all necessary equipment, such as computers, imported free of tax; modern accommodation and services supplied; and where, in theory at least, red tape is cut to a minimum.

The Santa Cruz Electronics Export Processing zone near Bombay is one of the longest established. (Figure 1 assumes use of SBEPZ facilities). Other zones include Bataan in the Philippines and a newer site near Colombo in Sri Lanka.

Ian Palmer is an independent consultant and co-author of Computer Weekly's successful Data Analysis series, now available in book form.

Figure 2. Factors in establishing a software factory.

Industrial costs are lower in North Yorkshire

Find out why and by how much
If you want immediate and long term savings in operating costs...
You should take a look at North Yorkshire

PHONE MIKE CUFF ON 0609 3123

• HARROGATE • MALTON • NORTHALLERTON • RICHMOND • RIPON • SCARBOROUGH • SELBY • SKIPTON • THIRSK • WHITBY • YORK and surrounding countryside.

North Yorkshire ROOM TO GROW

Find out why and by how much
If you want immediate and long term savings in operating costs...
You should take a look at North Yorkshire

PHONE MIKE CUFF ON 0609 3123

• HARROGATE • MALTON • NORTHALLERTON • RICHMOND • RIPON • SCARBOROUGH • SELBY • SKIPTON • THIRSK • WHITBY • YORK and surrounding countryside.

North Yorkshire ROOM TO GROW



Memorex's 2051 display station.

Display unit for IBM

THE 2051 Display Station, announced by Memorex, is a plug-compatible replacement for the IBM 5251 Model 11 Display Station, for use with IBM System/34 and System/38 CPUs.

The 2051, the first Memorex product developed specifically for this fast-growing market, attaches directly to the CPUs or through the IBM 5251 Model 12 Remote Cluster Controller.

It is unit-compatible with the 5251 Model 11 and can therefore be intermixed with existing IBM screens.

The 2051 is priced at £1,410 for a single unit, a saving of about 15% compared to the IBM 5251. Volume deliveries start in April.

Memorex UK (CW), Memorex House, 96-104 Church Street, Staines, Middlesex TW18 4XU. Tel: Staines 51488.

Graphics station designed with the operator in mind

A GRAPHICS workstation, the 2019W is announced by Westward Micro Systems, UK computer graphics manufacturing specialists, which has set up its own in-house marketing department selling direct to systems houses and end-users. Previously it has sold through a distributor.

Designed and manufactured to suit a wide range of users and environments, the 2019W is a workstation aimed at sophisticated CAD or graphics application needs.

A major feature of the 2019W is its ergonomic design, including a desk-top display unit which is adjustable for position, viewing distance, screen angle and tilt.

"Users who spend prolonged periods at a screen have long been neglected," said marketing director David Lade. "We believe manufacturers must provide a full range of adjustments for operator comfort."

The workstation has an enlarged display screen with a 19in tube.

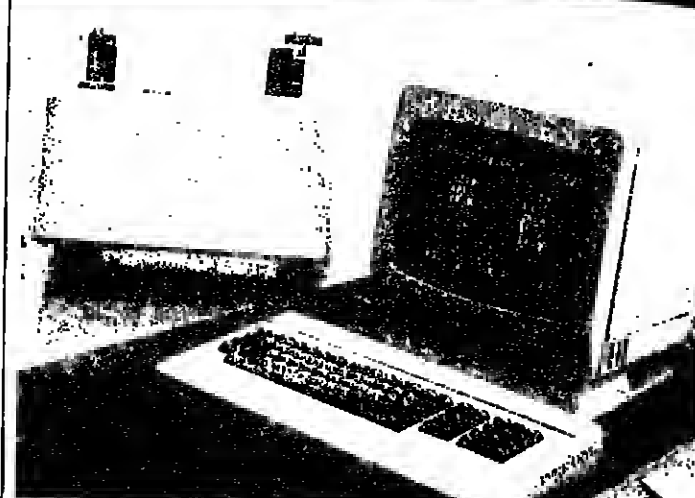
The anti-reflective green phosphor tube with bonded face plate combined with advanced raster technology provides exceptional clarity and stability of display whatever the lighting conditions. A colour-coded detachable keyboard allows the user to work with complete freedom, says Lade.

Software compatible with the Tektronix 4014 terminal, the 2019W gives a 1024 x 784 pixel resolution and can be used with Gino, Plot 10 and many other proprietary software packages.

Options include plain paper or electrostatic copiers, a graphics tablet and four-page VDU buffer allowing high speed scrolling and display "window" for easy text/graphics integration.

The 2019W is priced at under £7,000.

Westward Micro Systems (CW), Alexandra Way, Ashchurch Industrial Estate, Tewkesbury, Gloucestershire GL20 8NB. Tel.: (0684) 298600.



The Ferranti Chinese text processor including VDU keyboard and printer.

Chinese text system

A CHINESE processing system, which enables the user to input and process Chinese text using a keyboard and a visual display unit has been developed by Ferranti Computer Systems.

The processor incorporates a standard qwerty keyboard with two extra function pads of 8 and 12 keys respectively, inscribed with Chinese characters. These keys give the computer commands such as new paragraph, editing instructions, memories and print.

Text is input via the computer using Chinese phonetics.

The software helps the operator to select the correct character from a dictionary of over 8,000, and this becomes the next 'word' on the page. The text is stored on floppy disc.

Ferranti Computer Systems (CW), Wythenshawe Division, Simonsay, Wythenshawe, Manchester M22 5LA. Tel: 061-499 3355.

Low-price printer

WHAT is claimed to be the lowest priced daisy wheel printer on the UK market has been announced by Datarite Terminals. With prices starting at £475, the T-Printer 35 can also be used as a self-correcting electronic typewriter.

Based on the Olivetti Praxis 35 portable electronic typewriter, the T-Printer 35 is supplied with its own ABS-moulded carrying case and weighs 17lbs. It takes up to 12in wide paper and uses standard Olivetti 100 character typewheels. These include a number of characters not usually found on computer printers, such as numerical fractions. The T-Printer 35 can be set for 10, 12 or 15 characters per inch — a feature normally associated with more expensive computer printers and typewriters.

Operating speed under computer control is about 120 words per minute — and completely error-free.

The T-Printer 35 is available with Centronics parallel interface at £475, or with RS-232C serial interface at £535.

Datarite Terminals (CW), Calders House, 144-146 High Road, Chadwell Heath, Essex RM6 6NT. Telephone 01-590 1155.

Desk-top plotters

DRAFTING quality, space saving and economic pricing are just some of the features claimed for the CPS-16 and CPS-30 Compilot desk-top plotters.

The CPS-16 has a 22in plotting surface, plotting speeds of 10 ips or 15 ips, and four microprocessor controlled pens allowing varied pen width or four colour drawings on paper, Mylar or Vellum.

The microprocessor-based controller accepts data from RS 232-C level or 20mA current loop source and provides for automatic detection and rejection of transmission errors, local generation of alphanumeric characters, circular buffer memory and greatly reduced CPU time.

The CPS-16 features illuminated touch control of the pen up/down function, front panel selection of local or remote operation, paper and pen positioning via the jog and slow control, and scaling in both X and Y independently.

The CPS-30, a 22in plotter, offers four different intelligence configurations and five different interface capabilities.

Sinotronics Electronics (CW), 14 Arkwright Road, Reading, Berks. Tel: (0734) 85464.



The Trend DTA 1-30 data transmission analyser.

Trend in data transmission

TREND Communications, the data communications division of Philcom, has developed a microprocessor-controlled data transmission analyser, the Trend DTA 1-30, to meet the needs of manufacturers and users of data communications equipment, of engineers for in-situ fault diagnosis, and of programmers for software debugging and performance analysis.

The portable DTA 1-30 is a bit, block, character and message error rate meter which can be connected as a line monitor or as a high performance analyser simulating a DCE or a DTE.

In simulation mode, the DTA 1-30 will analyse a data channel in terms of signal distortion and error rate. Tests may be performed in simplex, half duplex and full duplex modes using internal or user entered test data or messages.

In monitor mode, half or full duplex data can be displayed on the 7in CRT screen in real time.

Trend Communications (CW), Knares-Beech Estate, Loudwater, High Wycombe, Bucks HP10 9QZ. Telephone: (06285) 24977.

Data General adds four peripherals to commercial family

DATA General has added four peripherals new to the commercial system (CS) computer family. They are a printer, magnetic tape drive, and two Winchester disc sub-systems.

The 4422 microprocessor controlled high-speed printer is a logic-seeking, bi-directional tabletop model. It features a 9 x 9 dot matrix print format, four printer formats (normal, compressed, elongated, and compressed-elongated); four-million-impression ribbon cartridge; and self-test capability. The printer has eight switch-selectable resident languages.

The Magnetic Tape Drive Model 6123 is a back-up device to the 125 and 25 Mbyte discs available on the commercial systems CS/10 modules C1 and C3 (the former having a memory of 64 Kbytes and the latter 128 Kbytes).

Featuring IBM and ANSI compatible tape format it has a recording density of 1600 bpi with a storage capacity of up to 27.3 Mbytes per reel and a data transfer rate to 48

Kbytes per second. It is supported by CS Interactive Cobol and CS Business Basic.

As a physical image back-up system, the drive is claimed to be 62.5% faster and to store up to 26.1 Mbytes more (a 2,000% increase) than diskette back-up systems.

The new Winchester discs for the CS/50 and CS/70 systems continue the company's practice of providing more storage — 46 and 53% respectively — at less cost across all its product lines, according to Data General.

The fixed disc systems feature a single-board controller that simplifies maintenance and increases configuration flexibility. The two discs provide 36 new CS packaged system configurations, thus allowing highly tailored performance and functionality to match the needs of the small business computer user.

Data General (CW), Hounslow House, 724-734 London Road, Hounslow, Middlesex TW3 1PD. Tel: 01-572 7455.

Drum memory 'faster than a Winchester'

A MOVING head drum memory, which is claimed to beat a Winchester on access speed and throughput and which is smaller and less expensive than comparable fixed head devices, is available from Vermont Research.

Designated the Vermont 6064, the 10.2 Mbyte moving head memory is designed to withstand shock, vibration, temperature extremes and particle contamination.

Although developed primarily for Vermont's traditional drum memory markets — telecommunications, process control and scientific research — the company sees potential in other industrial areas. Commercial applications are also

envisaged where the 6064 may provide an alternative to Winchester drives, especially in adverse working environments.

Costing about £3,000, the memory logically incorporates 78 cylinders, each with 131 Kbytes capacity, and 16 moving heads, compared with two, four or possibly six heads on competitive devices.

It has a track switch time of 10µs, and single cylinder seek time of 8.5 milliseconds.

The unit is no bigger than two eight-inch floppy disc drives.

Vermont Research (CW), Cleveley Road, Leatherhead, Surrey. Tel: (0372) 376221.

Sharp MZ-80K fitted with Daron's Triple-Vision.

Sharp Triple-Vision

A MULTI-screen microcomputer display system has been introduced by Daron Micro Centre for the Sharp range of personal computers.

For the Sharp MZ-80K and MZ-80B, two monochrome models are available. Triple-Vision provides output to a standard UHF TV or projection TV, plus up to 12 monitors with sound available on the TV.

The Multi-Vision provides sound and vision on up to 12 monitors fitted with audio play-back facilities. Multi-Vision or Triple-Vision are available from Sharp dealers at £35 and £79 respectively, fitting extra.

Daron Micro Centre (CW), 2 Abberdale Road, Sheffield S7 1FD. Tel: (0742) 585490.

Debt control system

OLIVETTI has extended its range of business computers with the introduction of the BCS 2099, designed to help users exert tight control over overdue debts.

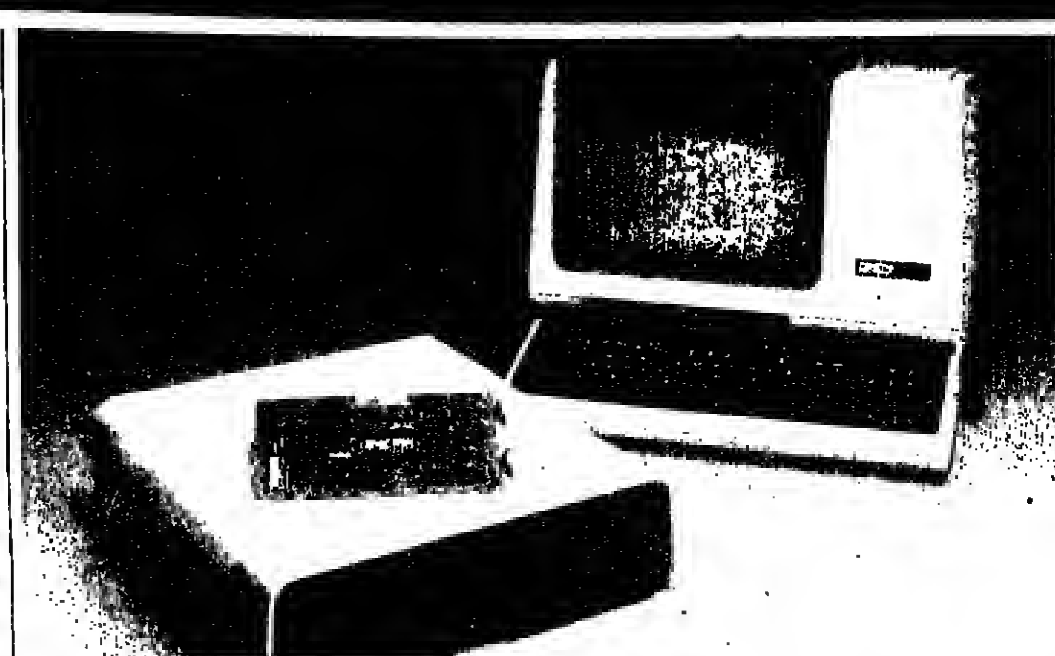
The BCS 2099 is a desktop system which is open to several different computer languages. The basic unit consists of the central processor, keyboard, 13 inch CRT, console and printer. The system may be expanded to allow more than one function at a time and to use a hard drive (10Mbytes).

DCU can also be connected.

New applications software has been introduced with the 2099. This is OCASP 2000, written in business Basic.

The system is aimed at first-time computer users and small firms, to whom it offers control of credit and control of the company's own expenditure.

British Olivetti (CW), 86-88 Upper Richmond Road, London SW15 2UR. Tel: 01-785 6666.



DEC VT 103 has 10 Mbyte Winchester and one Mbyte floppy disc.

Mass storage for the DEC VT103

ARROW Computer Systems plans to market a complete integrated system comprising a DEC VT103 combined with the recently launched Arrowpak 525 mass storage system for LSI-11.

The Arrowpak 525 provides the VT103 with up to 12.6 Mbytes of formatted 5 1/4-inch Winchester storage (256 byte sectors) plus up to a further one Mbyte on 5 1/4-inch floppy disc.

The Arrowpak 525 overcomes a common objection to the VT103 — the current mass storage systems available from DEC are too large for many applications.

The Arrowpak 525 is styled for desk-top use and measures 40x40x10 cms. The unit is AC powered and a single ribbon cable links it to the DEC VT103.

Lower capacity versions are available, the complete unfur-

matted capacity range being four, eight, 12 and 16 Mbytes on the Winchester and 250K, 500K or one Mbyte on the floppy.

This latest offering from Arrow will provide a complete computer system with mass storage at prices starting under £4,000.

Arrow Computer Systems (CW), Rosemount Tower, Stafford Road, Wallington, Surrey SM6 8RW. Tel: 01-647 0962.

Controller for Philips processor

AS PART of the development of its office automation plans, Philips Business Systems has made available a multi-line asynchronous (MLA) communications controller for its P7000 distributed processor.

The MLA offers users a microprocessor-driven controller capable of supporting up to 16 asynchronous lines. Together with the necessary protocols and device handling commands in the P7000's Vision language, the MLA allows integration of devices such as barcode or OCR readers with conventional keyboard data capture at the P7000 workstations.

It also provides asynchronous interfaces with completely separate terminals, handprint devices, viewdata terminals, telex interfaces or factory data collection equipment.

Single line asynchronous communications are already used on the P7000 Databook system where it interfaces with telephone charge monitoring equipment in several international hotels.

Philips Business Systems (CW), Elektra House, Bergholt Road, Colchester, Essex. Tel: (0206) 575115.

Dual density plotting for fast graphics output

VERSATEC has launched the Model 530 raster data translator which gives the standard 200 dot per inch with the option of 100 dots per inch dual plotting capability on the Versatec plotter range.

A large number of design and drawing applications require the facility for fast "quick look" out-

put during the design process, says Versatec. The Model 530 will produce check plots and screen dumps quickly, the company claims, and then allow the same Versatec raster plotter to produce high resolution plots of 200 dots per inch for finished output.

The Model 530 is considered useful in CAD/CAM, remote plotting, hard copy, and seismic and mapping applications because the use of its 100 dots per inch reduces the raster data transfer burden by 75% and at the same time significantly reduces host computer rasterisation, says Versatec.

Remote plotting users, using the

100 dots per inch facility, can reduce transmission time by three-quarters with the straight raster data, and by significantly more when Versatec's compressed raster data format is used.

Versatec (CW), 27-35 London Road, Newbury, Berkshire. Tel: (0635) 42421.

Portable stocktake system

A WHOLESALE/retail stocktaking package, based on hand-held microcomputer terminals has been introduced by MSI.

MSI's terminal system captures information during physical stocktake and produces an evaluation of the stock on site.

Benefits claimed by MSI for the system are that information regarding the value of stock is immediately available to the stocktaker and can be checked against theoretical stock values before other stock movements and transactions occur.

Also, the data preparation cost involved in recording stocktake data is eliminated.

The equipment used is an MSI 88 programmable portable terminal with up to 64,000 characters of data storage.

As the stocktaker moves around the warehouse or retail store counting the stock he records department, quantity and price on the hand-held terminal's keyboard.

The terminal calculates the quantity times unit price and stores the information against the appropriate departmental total.

The stocktaking routine can be undertaken in a strict department sequence or alternatively in random department sequence.

Stocktake data is stored in the terminal's solid state memory which can be reviewed using the terminal display and may be modified if required.

The cost of the terminal system is in the range £800 to £1,300 per unit, depending on memory size.

MSI Data International (CW), IVC Building, 19 Portman Road, Reading, Berks. Tel: Reading 580526.

North Yorkshire - High Techknowledgability

A major requirement of 'high tech' industry is the ability to recruit highly skilled staff, and it is common knowledge that these scarce people tend to be attracted to the more appealing parts of the country — like North Yorkshire.

If you're wanting to develop a thriving 'high tech' industry in a beautiful environment...

...you should take a look at North Yorkshire.

PHONE MIKE CUFF ON 0609 3123

•HARROGATE•MALTON
•NORTHALLERTON•RICHMOND
•RIPON•SCARBOROUGH•SELBY
•SKIPTON•THIRSK•WHITBY•YORK
and surrounding countryside



April 23-25

THE Computer Fair

Personal computers
Home computing
Small business systems

In all walks of life, personal computers have revolutionised computer power — bringing it within the reach of a far wider and more popular market than ever before.

In 1982 this revolution will explode onto the home and personal computer market. To meet this demand, Practical Computing and Your Computer announce a brand new event — The Computer Fair. The promotion of the exhibition will be heavily geared to attract the growing market of potential and existing users of personal computers from home computer enthusiasts to businessmen.

Bring your computers and services to life — all walks of life — at The Computer Fair!

Complete and return the coupon — we'll send you details.

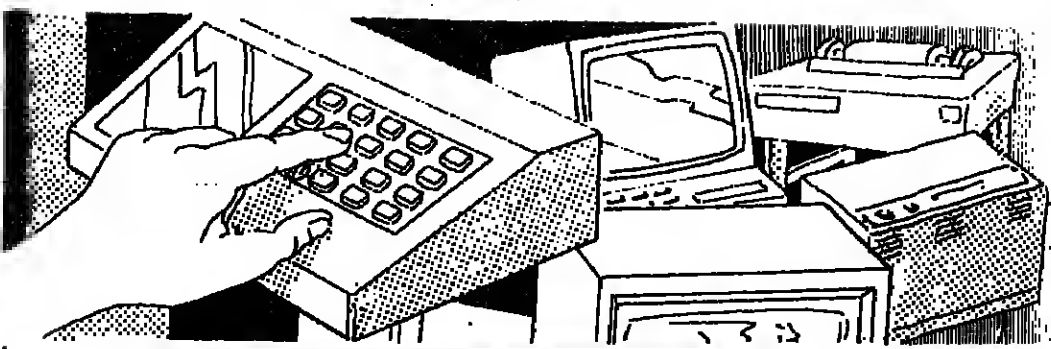
THE Computer Fair

Name _____
Position In Company _____
Company _____
Address _____
Tel. No. _____

Exhibition Manager,
THE COMPUTER FAIR,
IPC Exhibitions Ltd.,
1, Throby Way,
Sutton, Surrey, SM1 4QQ

April 23-25, 1982
Earls Court,
London

Bringing computers to life



CONTACT XENIA WHITE —
MARKET

FOR ADVERTISING RATES
PLACE

'PHONE
01-661 3500
ext. 3571

13339

FAST DEC!

DECTM BASED SYSTEMS
AND SUBSYSTEMS

- PDP-11/24, 34, 44, 70 ■ VAX-11/750 + 780
- DISCS FROM 10MB TO 256MB ■ TERMINALS
- PRINTERS FROM 30CPS TO 900LPM ■ MAGTAPES
- MEMORY ■ INTEGRATED OR ALONE ■ MAINTAINED

FULLY COMPATIBLE PROVEN PRODUCTS
INSTALLED FAST AT COMPETITIVE PRICES!

SYSTEK LIMITED, HR HOUSE, HIGH ROAD,
NORTH FINCHLEY, LONDON N12 0AZ, ENGLAND.
PHONE 01-349 2911. TLX 8952836.

SCOTTISH OFFICE: PHONE EDINBURGH (031) 226 5433.

REGISTERED TRADEMARK OF DIGITAL EQUIPMENT COMPANY

C.D.S.

TELEPHONE
AND DISTANCE
CABLE TELEVISION
RECORD

TELETYPE UNIT
TELETYPE UNIT
TELETYPE UNIT
TELETYPE UNIT
TELETYPE UNIT
TELETYPE UNIT

**DO YOU USE AN APPLE SYSTEM
IN YOUR BUSINESS?**

LOOKING AFTER IT IS OURS

Telephone for a quotation on your system

**C.D.S. COMMERCIAL DATA
SYSTEMS LTD.**

"ON-SITE" MAINTENANCE SERVICES
Specialists in the maintenance of Apple
Computer Systems. Including: Corvus, Elson,
Visiak, Dume, Amdek, Paper Tiger, Epsom,
Centronics, Das, Qxi, Neo

**SOUTHERN AREA SALES
TELEPHONE: 0268 710282
Downham Road, Ramadon Heath
Billerica, Essex CM11 1PU**

**NORTHERN AREA SALES
TELEPHONE: 0708 210690
Scapco Road, Brentnall
Lancashire B84 7PA**

NEW/USED COMPUTER EQUIPMENT
BUY OR SELL THROUGH

WIDOP

SAMPLE UNITS AVAILABLE FOR SALE:

Burroughs 185, IBM Computers - Computing Room Modular Filing
 NCR 6260 Systems and Peripherals - Hesdine 3000 VDU's
 IBM 2340 Data Module - IBM 6250 Mod -
 140 cps Printer - IBM 0281/128 Card Punched
 Diablo 3000/3700 Complete Systems with maintenance - Forms Handling
 Equipment



Call 1-800-848-1400 for more information or to schedule a visit to our office.

**NEW DE LUXE 80 COLUMN
 HAND PUNCHES (EX-STOCK)**

WIDOP

01-484 8011
TELEX 898859

WEBSTER P SERVICES LTD
 55 WINDHURST ROAD, BRIDLE
 KENT BA1 3AA




DEC. PDP11.

**FLOATING POINT
AVAILABLE
EX-STOCK**

FP11-A.....PDP11/34
FP11-F.....PDP11/44
FP11-C.....PDP11/70

ALL AT DISCOUNTED PRICES

 fungus

COMPUTER PRODUCTS LIMITED

No. 1 Westmorland House, 2nd Floor, Teesside Street, Wakefield,
West Yorkshire, England. Tel: (0824) 60274/5/6. Telex: 557644

DEC & PDP11 are registered TRADEMARKS of DIGITAL EQUIPMENT CORP



PRODUCT LINE:

- ★ NEW & REFURBISHED MAGNETIC HEADS
- ★ AIR FILTERS
- DISK DRIVES
- DISK DRIVE REPAIR
- DISK PLATTER



s, Calcomp, Dec, Diablo/Dri, Data General, ICL, HP, Memorex, PerteC, Wangco, Xerox, IBM.

Computer Parts & Accessories Limited

ons Hill, Bromley, Kent **01-464 7227 Telex: 896559**

BUYING
SELLING
LEASING?

**COMPUTER
RESALE BROKERS**

CRB House, 33 Church Street
Dunsgate Park, Harpenden Herts AL5 100A
Telephone: (0256) 55431
Telex: 058049

CRB

A JAMES COMPANY

**BURROUGHS B800 SYSTEM
FOR SALE**

Processor, 80K Memory Console
with 150 cps Printer, 18.0M8 fixed
disc unit, 8.2M8 removable disc
drive, 350 lpm printer, TD830 VDU
and 2 TD 700 VDUs. Peripherals a
new.

Offers:
John Barker 01-928 2388.

OXFORD UNIVERSITY
Software Engineering

The MSc in Computer at Oxford University has been specially designed for graduate programmers and systems analysts who seek advancement as software engineers. Modern methods of system design, specification and implementation are taught, with emphasis on distributed systems, microprocessors and problems of relevance to industry. Full details from Tony Hoare, Oxford University Computing Laboratory, 46 Banbury Road, Oxford, OX2 6PE.

ATTENTION

To advertise your new, used or redundant computer equipment, services, or property for the computer industry, in the Marketplace section, please telephone me:

Xenia White
on 01-661 3500, Ext. 3571
for rates and details

DEC and DATA GENERAL

Buy, Sell or Trade

Sample of items immediately available

● S/140 Memory	● ALM-9	● MMB-EJ
● OCU 200	● 8028 Tape Drive	● RK05-J
● Comma Channel	● Tridion 150 50MS Disc	● M7850

Call: Alcatraz Data, 01-487 1985 or 01-487 8499

Thomas Business Systems, Ltd.

Special offer
on
11/24 and 11/44
with or without RL02s,
ex stock

Dectrade Ltd
Network House, 20 Ludlow Hill Road
West Bridgford, Nottingham

Tel: 0802-232265 Telex: 377679 NETWORK

FOR SALE
New IBM 5256/003
Serial Printers.
Contact: J. Gunter
01-349 8111.

Computers Bought and Sold
FOR SALE
 Burroughs 980, 992, 9800, L9
 DEC RK05, TUJ6, L501, VTE
 RK01
 PDPA modules memory
 DG CS30, HP 3000
 IBM 34, 38, 3100
WANTED
 BCL Molecular 18 Mk. II
 Burroughs B91, B1850
 CDC 9752, DEC 11/46, 11/70
 DG Nova 3 D200, HP 7925
 ICL 10/22, P1130 51331
 Phillips P330, T1850
E O B LIMITED
 Tel: 0783-44777
 Tel: 0783-537783

APPLECASTLE LTD.
are pleased to announce
**The new ICL
White Box
Microcomputer**
(Tradeprice???)
Order now - Discount on bulk
purchase
Trade-in allowed on other com-
puters
Buy ICL, buy BRITISH, Buy the
BEST
For further information write
to: ICL, 100 Islebox, Applecast-
le, International Business
Centre, 18 Mortimer Street,
London W1
Telephone: 01-497 6277
(Lines 2627-2632)

WANTED
IBM/ICL
REDUNDANT/OBSOLETE
COMPUTERS

Raybold Computer Services, Unit 1
West Station Industrial Estate
Spillat Road, Mallow, Essex
Tel. Mallow (0621) 64665

**The lowest
prices
in Britain?**

Check our prices for

LA34 LA120
VT100 WD78

SERIES WORD PROCESSOR

AND ALL OPTIONS

● **OFF THE SHELF DELIVERY**
● **NATIONWIDE SERVICE**

MCS 269-271 Barlow Moor Road,
Chorlton-cum-Hardy, Manchester M21 2GJ.
Tel: 061-861 0757 Telex: 667151 MCS G.


FOR SALE
Burroughs L99
Available immediately
Offers invited
For full details -
telephone: 062-987 351

**VDU
COVERS**

- Tailor-made.
- High Quality PVC for protection and colour.
- Versatile contact sheet or board.

**VIDEO
COVERS**

1 BRYANSTON CLOSE
NORWICH, NORFOLK
NR2 1JH
EAST SUSSEX
BN1 230
Tel: 01603 297966



DEC TIME FOR HIRE

1st DEC 11/22nd FL01,
AL02, RK03, RK02,
Meatspe
RBR-11M, RT11

- Datacon/terminations
- Development
- Word Processing
- Daily Of Work
- Back-up Machines
- Book-keeping/Ledger

Stand alone from C10 p.h. Discounts
neg. for long-term use

Tel: Bob Flattling
Or 444 3200 evenings
01-536 8124 days

**WANTED TO BUY
ICL COMPUTER EQUIPMENT**

From user or broker:

7502/10,	2508
7681	2509
757B	

Ring London 01-890 4477
Mr. K. Hatfield
after 15th March ring
Sydney, Australia, 02788548 (reverse charges)
AUTOMATED DATA SERVICES

**2 x Philips P320 Visual
Perform Computers**

with agricultural and business displays

Complete Mr & R. Best, Westley Ltd, Redway
Park, Tring, Bucks. HP23 5LJ. Tel: 0494 511111

APPLYING FOR JOBS

Use your applications the professional way. Have your CV and cover letter prepared now on a XEROX 850 processor.

**GASEMAN
WORD PROCESSING**

1, Aspley Park, Clonsilla
Leamington CV32 3JG


CSP


COMPUTER SYSTEMS & PRODUCTS

Hardware · Software · Engineering ·
Bureau Services

Specialties: Design · Systems · Word
Processing · Communications ·
Data Entry · Graphics ·
DBMS & dBase

LSI-11/23 Add-on Memory
256KBytes, Taxes Memory
\$1,000
cash with order
Delivery from stock
Graham Wright Computers
0332-49523

**DO
YOU NEED
DATA
LEADS** 

 **?** We supply all types of communications cable and connectors for all types of computer.

*Any lengths supplied by return.

If you have a new system, our complete computer package includes clean electrical supply, data communications cabling with protective circuitry and air-conditioning.

For a speedy and efficient installation ring:

BARKERS
of Bedford
(0234) 67168

Approved by leading computer companies

Big news for everyone selling computer products and services to the Middle East

We've opened up the Gulf!



The arrival of IPC's unique new publication **Middle East Computing**, means nothing less than that.

For the very first time, computer users in the rich C States—and throughout the Arab world—have a regular journal reporting on the technology and services available to them, world-wide.

So now you can talk direct—and sell direct—to potential customers throughout this vast, fast-growing market. A market which imported more than **£74,000,000** worth of computer hardware alone in 1980.

How we've done it

Middle East Computing began as a single-issue publication, backing the Gulf Computer Exhibition and Conference at Dubai last December. Its enormous success revealed such an urgent and widespread demand for computer product information that it will be published regularly from April.

6000 copies will be sent to established computer users or key personnel within government and major business organisations, in the Middle East countries predominant in the computer market. The circulation was compiled through the full research resources of Computer Weekly and IPC Business Press backed by contacts made at the Gulf Computer Exhibition.

Starting April, through Middle East Computing, a vast, lucrative, crucially important export market will be thrown wide-open. If there was an open-and-shut case for advertising this is it! Get the full details from...

Middle East COMPUTING

IPC Electrical-Electronics Press Ltd
A Computer Weekly publication
Advertisement Manager: David Hays, Middle East Computing
Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS
Tel 01 661 3500 Ext 6530

Electronic Brokers

**£1million
DEC
SALE**

**NEW SYSTEMS
IN STOCK**

SM40-MMA-CN 11/14 CPU
256KB, H9642 CAB, TU58, 2 x
R102 Disk, LA120 Console,
RSK11-M

SMFX-MMA-DN 11/24 CPU
256KB, H9645 CAB, 2 x R102
Disk, KT24, VT100 Console,
RSK11-M

PROFESSOR

POPA 10M 32KW MOS (new) £1,790
PD111/04 10M 32KW MOS (new) £2,830
PD111/34 12KW MOS £5,000
PD111/34A 26KB MOS £5,000
PD111/38 32KW Core £2,380
PD111/40 32KW Core, KT110 £4,680
PD111/44 26KB Core £6,000
PD111/44 26KB TQ58, Cab £12,750
PD111/48 32KW Core, Cab £6,950
PD111/48 32KW Core, Cab £7,100
PD111/70 512KB MOS £20,000

RSK11 14mm (new) £2,500
RSK11 R102 & cab £4,200
RLT1 R102 & cab £1,750
RLT1 R102 & cab £2,200
RLT1 70mm £1,450
RLT1 70mm & cab £2,200
RWMDR MOS & cab (new) £18,000
RX26 Dual Floppy & cab (new) £500
RX11 800 Lpm & cab (new) £2,700
RXV1180 Dual Floppy & cab (new) £290

LA36 80 30cps 20mA (new) £250
LA36 80 30cps R3222 (new) £250
LA36 RRR 30cps 20mA £495
LA36 RSR 30cps R3222 £495
LPI 1200 Lpm & cab £2,700
LP04 800 Lpm & cab (new) £2,750

Specialising in equipment
As New, Condition

**ELECTRONIC BROKERS
LIMITED**

61/65 Kings Cross Road,
London WC1X 9LN.

TEL: 01 278 3451

Telex: 29806A

هكذا منه لأجل

Senior Computer Programmer

Lucas Aerospace is a leading European manufacturer of aircraft components. Its Engine Management Division, based in Birmingham, is in the process of introducing a range of new manufacturing systems based on the IBM business package - COPICS.

Computing is based on IBM 3033 Mainframes and 8100 distributed processors with MVS and DPPX operating systems. Applications are invited from experienced COBOL Programmers. Some experience of MVS, CICS, DLI or IMS would be an advantage.

The successful applicant will work as part of a small team of analysts and programmers who are responsible for the implementation, maintenance and development of a range of manufacturing systems.

Applications in writing to Mr P Wilkinson, Industrial Relations Officer, Lucas Aerospace, Shaftmoor Lane, Hall Green, Birmingham.

Lucas Aerospace

Our client, the leading UK Videodata manufacturer and distributor, seeks the following high-calibre staff as part of their 1982 expansion:

Sales and Marketing Director

The successful candidate will have a first-class record, motivating and controlling a small specialised salesforce.

He/she will be conversant with the videotex and micro-computer markets, and have experience in devising and implementing sales and marketing strategies in this field. Experience will include new product launches, and direct selling contact with both major national accounts and small business users.

As overall responsibilities will include sales network development, sales literature and promotions, advertising and exhibitions, a record of personal achievements in these areas is needed.

This is a senior appointment, likely to appeal to ambitious and experienced people aged 28-35. The job will involve travel both in the UK and overseas.

National Accounts Sales Manager

This senior sales person will extend sales of videotex and micro-computer equipment to major national accounts - large companies, professional, administrative, educational and governmental bodies. Widespread travel will therefore be involved.

Candidates (male or female) will need to demonstrate sales experience in this sector, and also the confidence and authority to negotiate directly at a senior level in systems, finance, and general management. You should be experienced selling systems and concepts, with a working knowledge of the technology involved, as well as selling hardware.

Computer Development/Design Engineer

This versatile Computer Engineer will probably be aged 25-30, with a good Degree in Computer/Electronic Engineering. He/she is required to provide technical development of current videotex terminals, and to evaluate and develop changes or improvements required by specific customers in the UK and overseas. There will be considerable customer contact through direct involvement in Q.A., and in responding to a wide range of client queries.

The engineer will also work closely with the team developing new products, and may ultimately become directly involved in this area.

All these posts are based in Berkshire and will carry an attractive salary and benefits package, based on experience.

To apply, please write to Confidential Reply Service, Ref ABC 642, Austin Knight Limited, Tiverton House, 51-53 Hagley Road, Edgbaston, Birmingham B16 6TT.

Applications are forwarded to the client concerned, therefore companies in which you are not interested should be listed in a covering letter to the Confidential Reply Service Supervisor.

Austin Knight Advertising



Smiths Industries have an international reputation for precision control and monitoring equipment utilising advanced digital electronics in aerospace and defence applications.

With major expansion recently achieved we are now looking for the following responsible personnel to join our Management Services Team.

Information Services Manager

Reporting to the Management Services Manager, you will be responsible for providing, and improving, information services to the site user departments through real-time and batch processed commercial computing systems on an ICL ME29 computer. You should have substantial operating management experience preferably using George 2+ ICL ME29 operating experience would also be desirable.

Systems Analyst

You will report to the Systems Manager and have responsibility for the review, development and implementation of commercial systems (currently based on the site's ICL ME29 computer).

A degree standard of education is preferred allied with 2-3 years experience in systems or computer related disciplines, ideally achieved in a manufacturing business environment.

For both of these positions, we offer an attractive salary, bonus and relocation expenses (where applicable) plus a range of benefits including pension and sick pay schemes, subsidised canteen and social club facilities.

For an application form, please contact our personnel officer Laurie Deadman, on Basingstoke (0256) 3191 or write to him at the address below. Alternatively our Ansafone service is available outside normal working hours on 0256 22744.



**SMITHS INDUSTRIES
AEROSPACE & DEFENCE
SYSTEMS COMPANY**

Basingstoke Division, Winchester Rd, Basingstoke, Hants RG22 6HP

Systems Programmers

Plans for the future development to complement our sophisticated range of computer systems and terminal equipment has created the need for additional programming professionals. From our Croydon Plant we design, develop and manufacture specialist products for the banking, manufacturing and communications industries.

We are looking for Programmers and Senior Programmers with varying years of experience to work on systems design in the software capacity. Involvement will cover the following areas:

- ★ Operating Systems
- ★ Interpreters
- ★ User Interfaces
- ★ Maintenance and Diagnostic Test Routines
- ★ Data Communications

Some international travel is expected, primarily to the United States. Career prospects within the Company are excellent with provisions for transfer in the above subject areas being part of our development plan.

An attractive benefits package is offered which includes relocation expenses where appropriate.

Write or telephone:

Personnel Department,
Burroughs Machines Limited,
512 Purley Way, Croydon,
Surrey. CR0 4NZ. Tel: 01-888 0365.

Burroughs

FOR
CLASSIFIED
ADVERTISING USE

DIRECT
LINE
01-661 0121

Senior Analysts & Programmers for Major Development Programme

c£8.5k-£11k

South Bucks

AMERSHAM INTERNATIONAL is a world leader in the supply of sophisticated technical products for use in medicine, research and industry. Operating on a world wide basis, ours is a fast growing high technology company offering a stimulating and unusual working environment.

The expanding business calls for a rapid expansion in Corporate Information Systems resources to meet the needs of an ambitious systems development programme.

We are looking for experienced Systems Analysts and Programmers to contribute towards the development of a range of on line data base systems for a distributed processing environment.

We need computer professionals who must offer the following:

Senior Analysts

- ★ More than 4 years' design experience
- ★ A Commercial and/or Production System background
- ★ Experience of data base and on-line systems design
- ★ Knowledge of structured design techniques

Senior Programmers

- ★ More than 4 years' programming experience
- ★ Team leading experience on at least one project
- ★ Experience of data base and on-line systems development
- ★ Knowledge of modern programming techniques eg Jackson
- ★ Extensive COBOL language experience

We currently operate an ICL and HEWLETT PACKARD based network using the IDMS and IMAGE data base systems. Experience with these product ranges would be advantageous.

Candidates, who should be educated to degree level and able to make a positive contribution in a rapidly evolving situation, should reply in writing with a full C.V. to Tim Phillips, Senior Personnel Officer at the address below. Alternatively please telephone Little Chalfont (02404) 4444 ext. 3569 (Answerphone ext. 3568) for an application form.

Amersham International plc
White Lion Road, Amersham
Buckinghamshire HP7 9LL

Amersham

COMPUTER SPECIALISTS South Africa

Please send career details or ask for an application form
J.E. Fleming
GENCOR Recruitment
30 Ely Place, London EC1N 6UA.
Tel: 01-404 0873

GENCOR

mines gold, platinum, coal, chrome, manganese; makes steel; manufactures pulp and paper; builds roads and ships; and with many other activities provides employment for 200,000 people.

GENCOR COMPUTER SERVICES is our Group computer bureau. With a Head Office in Johannesburg, main frame IBM and UNIVAC centres in the Johannesburg area form the hub of advanced data communications networks inter-linking the commercial and technical operations of our widespread and diverse activities. Services provided include mainframe services, consultancy and mini/micro support.

Progressive career positions in the bureau are offered to:

ANALYST PROGRAMMERS - 4 or more years DP and COBOL experience
PROGRAMMERS - 1 or more years COBOL/BASIC experience
TELECOMMUNICATIONS SPECIALIST - experienced in network management/protocol handling in a multiple vendor environment.

Salaries are negotiable and accompanied by the benefits expected of a leading group including home ownership plan, free medical aid, excellent pension scheme and generous leave. For senior positions a company car will be included as part of the package. Family air passages and relocation expenses are paid.

These career development opportunities are matched only by the South African life style, with standards of housing, shopping, medical and children's education facilities which themselves match the superb climate.



CONSULTANCY!

Young expanding UK Division of International Systems Software Leader, is offering you this exciting opportunity.
In addition to Excellent Salary, Company Car, BUPA, Life Assurance Scheme.
You will enjoy: Travel, Training, Troubleshooting, Pre/Post Sales Support and General Consultancy.
If you have a solid Mainframe background (preferably IBM) with some understanding of Data Management Systems and feel that perhaps this is drifting by then this could be for you. Ref: PH160

A.B. EXECUTIVE (WEYBRIDGE) LTD
0932-41321

FOR
CLASSIFIED
ADVERTISING USE
DIRECT
LINE
01-661 0121

Logitix

Logitix Recruitment Limited
10 Grenville Place, London SW7 4RW

Telephone 01-373 3063

IMS Specialists

Holland: Salaries to £16k

A leading Dutch Systems and Software Consultancy, with its Headquarters in Amsterdam, has an urgent requirement for IMS Specialists. Suitable applicants must offer current or very recent IBM programming experience in either COBOL or PL/I and must be fully familiar with the internals of IMS. Working as a senior member of a project team you will be involved in the design, coding and implementation of systems in the areas of sales and trend forecasting, stock control, inventory control and budgetary analysis. Whilst this client would prefer candidates to join the Company on a permanent basis, there is a possibility that a long term contract may be offered. Ref: L/10/A

Circuit Design Manager

Thames Valley: Salary to £15k

The Research and Development facility of an outstandingly successful, British, electronics company has a vacancy for a Design Manager to oversee the activities of a number of project teams. The successful candidate will be expected to have extensive knowledge of systems logic design and be able to translate queries and problems between silicon fabrication engineers and systems designers. A degree of H.N.D. in Electrical or Electronic Engineering is essential as is familiarity with the application of C.A.D. techniques to LSI and VLSI design. Applicants with the ability to identify and develop new product areas will be of particular interest to our client. Ref: L/10/B

On-line COBOL Programmers

Central London: Salary to £11k+

Our clients are seeking several COBOL Programmers for their recently upgraded installation. You will be actively involved in the development and testing of a suite of programs written in COBOL for an on-line facility. It is an absolute condition that you offer a minimum of two years on-line COBOL programming experience, preferably gained in a mini-computer environment. A significant function of these positions will entail close liaison with the Company's financial and accounting personnel. Since the Company has ambitious plans to develop and implement a number of systems within the next year, successful candidates can expect early involvement in system design/analysis or an internal consultancy position. In addition to an above average salary, the Company offers a very low interest rate mortgage and a comprehensive range of non-contributory benefits. Ref: L/10/C

Data Communications

Central London: Salary to £14k

A highly regarded supplier of Hardware and Software Systems is seeking a number of Data Communications and Telecommunications Engineers for its Central London operations. Successful candidates, who should hold at least one numerate degree, must be fully aware of the high technology products currently available i.e. Word Processors, Local/Remote Area Networks and Message switching devices. Of particular interest will be those candidates who have a profound knowledge of communications protocol techniques i.e. X-25, SDLC/HDL, Good personal presentation skills are of paramount importance since you will be expected to liaise and co-operate with both technical management and non-technical users. All positions will entail a degree of travel within the Home Counties area. Ref: L/10/D

FORTRAN Programmers

Home Counties: Salary to £9k

FORTRAN Programmers are urgently required by the design and development group of an engineering consultancy. Suitable applicants will probably be graduates who have a minimum of 1 year's industrial experience in a real-time mini-computer environment. It is essential for all positions that you offer fluency in FORTRAN and a substantial knowledge of an Assembler would be a distinct advantage. Whilst there is no particular hardware requirement, there is a stated preference for candidates who have had exposure to DEC PDP11. These positions represent outstanding opportunities for applicants who wish to be involved in the design and development of complete systems in the engineering industry. Career prospects are excellent and there will be many opportunities for overseas travel should you desire. Ref: L/10/E

Process Control Systems

Central London: Salaries to £15k

A Systems and Software House, with an excellent reputation for providing total systems solutions, has a number of vacancies for Programmers and Project Leaders with at least two years' Process Control systems experience. Suitable candidates for the senior positions will be required to have had responsibility for system hardware procurement, installation, commissioning and software generation, preferably in the chemical or oil industries. Applicants for the Programmer posts should be fluent in an Assembler and a high level language such as Pascal or RTL2. Although the vast majority of work is in-house, occasional visits to client sites will be required and a degree of mobility is, therefore, essential. Ref: L/10/F

Real-Time Computing

Surrey/Hants: Salaries to £12k

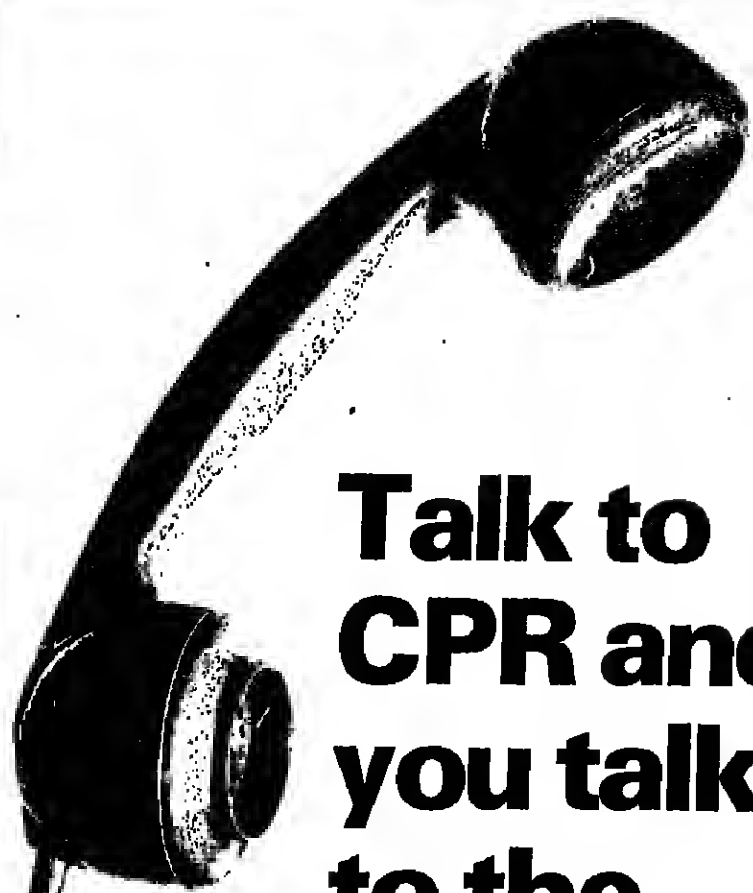
On behalf of an expanding Systems Supplier and Consultancy we are seeking a number of Software Programmers and Applications Engineers. Of particular interest will be those who have participated in the development of PDP 11 or VAX based real-time systems or alternatively, have gained experience of simulation systems utilising any 32-bit minicomputer. Software expertise should include fluency in a high-level language such as RTL2, Pascal or FORTRAN with preferably a good knowledge of an Assembler as a subsidiary skill. Candidates who have also worked in a multi-microprocessor environment will be especially welcome. Certain positions will entail a degree of mobility both nationally and internationally. Ref: L/10/G

VAX Progs./Designers

London & E.E.C.: Salaries to £15k

A leading International Systems Company specialising in the development and sale of computer software is seeking experienced Programmers and Designers for its Central London and overseas facilities. Suitable candidates should hold a numerate degree and have two years' subsequent programming or systems design involvement. Fluency in FORTRAN is essential and it is preferable to have had exposure to either a PDP 11/RX-11M or VAX/VME configuration. Candidates who are fluent in a foreign language, especially French or German, will be of particular interest to our client. A degree of mobility is necessary since most positions involve both European and Transatlantic travel. Ref: L/10/H

Licenced by O.G.E. L.C.No. SE/50/13 (8776)



**Talk to
CPR and
you talk
to the
World!**



If you are an experienced computer professional seeking employment at home or overseas – on a contract or permanent basis – you need very special advice and guidance from people who will look after you and point you in the right direction.

Although you may have set ideas about a future career path, an informal chat with professional advisors could show that you have grossly under-estimated your own potential.

No matter where in the Computer World you wish to work – CPR is more likely to find the right placement for you.

It costs nothing but a phone call to find out.

Ring 0532 523555

(24 hour answer service)

CPR Consultants Ltd /Worldwide Recruitment

Head office: 31a Commercial Street, Morley, Leeds LS27 8HX

Below is just a small selection from the many positions CPR is currently seeking to fill.

CONTRACTS Long Term! Top Rates! Europe & UK

IBM/ICL or IBM – all levels.
UNIVAC 1100 COBOL with OMS – German speaking.
ICL 2900 VME/8 COBOL – Prog.
IBM 8100 ODPX COBOL – Prog.
ICL ME20 Software Technician – Holland.
IBM OS COBOL – Structured Techniques.
IBM Manufacturing Systems Analyst.
UNIVAC 1100 COBOL with TIP.
Honeywell level 8 COBOL or SCREENWRITE.
IBM ODS or OS System Programmers.
IBM COBOL CICS & QJ1.
IBM ADABAS Applications Prog. – Holland.
DEC PDP/VAX, SYSTEL Telecoms expertise – Holland.
WHEN PHONING QUOTE 'CONTRACTS'

USER INSTALLATIONS

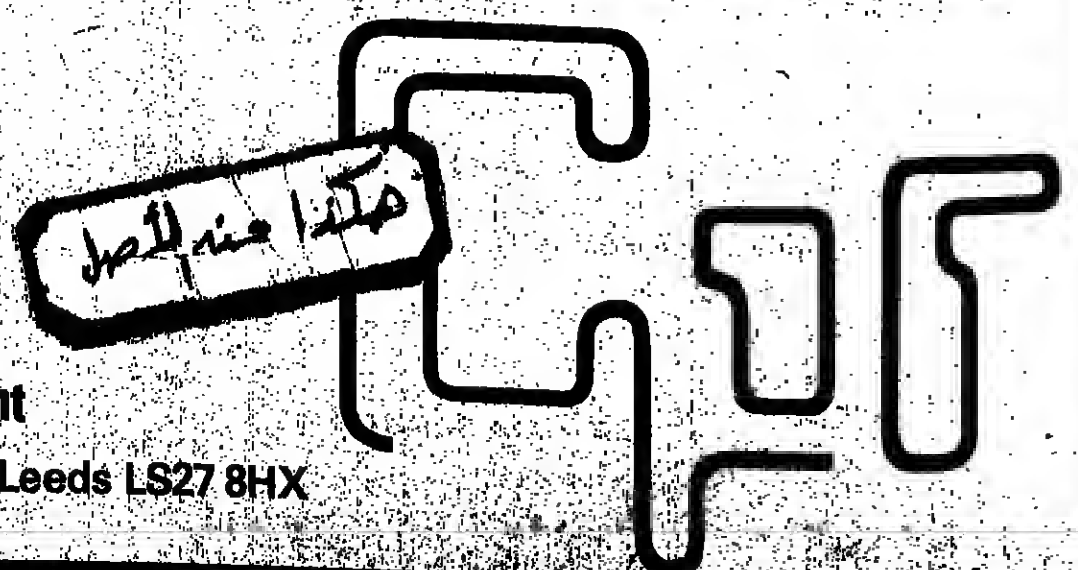
Location	Position	Rate	Location	Position	Rate
South Coast	IBM Programmers	to £8,000	Ireland	Consultants	to £11,000
N. West	COBOL Programmers	to £7,800			+ Car & benefits
London	Systems Eng. BSX 11M	to £12,500	N. West	Systems Analysts	to £12,000
E. Midlands	Programmers COBOL	to £10,500	S. Coast	Systems Engineers	to £12,000
	+ benefits				+ benefits
W. Yorkshire	Programmers COBOL	to £8,500	Uncolshire	Analyst ICL	to £10,000
S. Yorkshire	Systems Eng. Furum, Coral	to £8,500	E. Midlands	Programmers RPG II	to £8,500
N. Yorkshire	Programmers DEC	to £8,000	W. Yorkshire	Analyst/Progs. RPG II	to £8,000
Hampshire	Programmers IBM, ICL	to £11,000			
London	Systems Analyst IBM ICL	to £12,000			

WHEN PHONING QUOTE 'USERS'

MANUFACTURING SALES SUPPORT AND ENGINEERING FUNCTIONS – WORLDWIDE

There is always great demand for Top Professionals. However up to 80% of positions are rarely advertised. Where ever you are or desire to work – CPR's overview of the World Market can connect you with the grapevine to a more satisfying career.

WHEN PHONING QUOTE 'SALES & ENGINEERING'



MODUS

International Personnel Consultants
Modus Management Services Limited
148 Watling Street, Radlett, Herts. WD7 7JH
Telephone: Radlett (09276) 3077

N. Hampshire **IBM Software Design** £10,000-£16,000

These are unparalleled opportunities to design and develop a brand new CICS TP system with an international and highly respected consultancy. Clearly, this project will provide amazing and much sought after experience to those lucky enough to acquire a place on the team. In addition to this, and the excellent salary, the employment package includes a bonus scheme, pension scheme, free private health care, free life assurance, a discount stock purchase plan and opportunities for extensive travel. In return, the company expect a high level of commitment and a desire to extend your knowledge in database and teleprocessing technology. The essential skills are as follows:

CICS System Designers Required is a deep experience of systems design and a thorough understanding of CICS plus total fluency in Assembler. The responsibility will be for system design and programming of the TP system.

CICS Programmers A significant track record of programming in Assembler and a good knowledge of CICS. The responsibilities will be to produce high quality results to agreed schedules in a development environment.

Systems Programmer Amongst other duties, this person will be responsible for setting up and supporting a 4300 system which will be used as a development machine running both DOS and OS under VM. Applicants must be fluent in Assembler and CICS and also fully experienced in all aspects of systems development. A real challenge.

Contact: Mike Creamer CW26 A

ATE Software Design

Dorset **to £10k**

At the heart of any modern automatic test system is a creatively designed software package and, to enable our client to maintain its position at the top of the ATE league, further innovative software designers are required to work on exciting new projects. Facilities and prospects are excellent, as is the location of this forward looking and dynamic company.

The future is there, do you have the necessary past? The requirements are: a degree level education and at least 2 years experience in real time programming, or software design, preferably in a scientific or engineering discipline. Current ATE software designers will of course be looked upon with favour.

Contact: Dennis Melling CW26 B

Technical Author (French speaking)

France **to c.£17k**

A world famous manufacturer of computers and computer systems, requires an experienced Technical Author at its Paris facility to work on varied and interesting projects. The successful candidate must have English as the mother tongue, have a good grasp of the French language and be technically conversant with micro/mini computer systems. Additionally, some experience of the following: the use of the Z80, CPM, BASIC, BAL, FORTRAN and/or COBOL would be desirable.

Contact: Dennis Melling CW26 C

Recruitment Consultants

We are still looking for personable, business-minded applicants in their mid-twenties who are interested in joining our committed and successful team when we move to our larger offices in Dursley.

Contact: Mike Creamer CW26 D

If the advertised positions do not match your experience or aspirations, the Modus Consultants are always available for a confidential discussion of other vacancies available. An informal meeting – often an essential part of the process – can be quickly arranged.

SWITZERLAND **Package 17-22K**

We are seeking a number of candidates to expand our team working in SWITZERLAND on one of the worlds most advanced Integrated Digital Communications Systems.

All candidates shall have a proficient knowledge of GERMAN and shall have had experience in one or more of the following areas.

- * DATABASE DESIGN
- * MAN MACHINE INTERFACING
- * VERIFICATION AND REVIEW OF DESIGN DOCUMENTATION
- * REAL TIME DEVELOPMENT
- * PROCESS CONTROL

UNITED KINGDOM **Package to 15K**

We are also seeking candidates who will be prepared to relocate within the U.K. It is essential that candidates shall have a minimum of three years experience with a good knowledge of FERRANTI IN CORAL.

For further information phone 01-530 3186 or write with C.V. to the address below:

60, NEW WANSTEAD, LONDON E.11 2AD.
APPLIED Technology
Systems and Software Engineering
AT ITS BEST

GERMANY

These openings – with an organisation well known to us – are strongly recommended to candidates wishing to move to Germany. The client – a multi-national corporation – has its data centre in a town in the heart of the wine country, where the hardware comprises dual 4341's with 8100's as terminals. We have recruited a considerable number of British staff for the company over the last few years and they are now reaping the benefits of the higher German living standards as well as advancing their careers in a technically stimulating environment.

IBM PROGRAMMERS

PROFILE Ideal candidates will be graduates in their twenties with sound IBM programming experience. Knowledge of on-line working and the technicalities of computing are the main requirements but training will be given to fill gaps. A mature personality with drive and determination and a strong commitment to living abroad are equally important.

SALARY Salaries can be anything from 50% to 100% higher than in the UK whilst living costs are similar.

CAREER DEVELOPMENT Training and career development are taken very seriously and some of our earlier recruits have already made significant career progress.

LANGUAGE English is the working language but a willingness to learn German for personal and social reasons is expected.

INTERVIEWS Client representatives will be conducting interviews in Nantwich on 25th March and in London on 26th March. For an initial discussion, ring me, Neville Jones, on (0270) 89708 office hours or on (0270) 213118 other times, or write to me at the address below, quoting ref. 408/CW

ACCOMMODATION There is excellent accommodation to rent at reasonable prices, and the company provides a good relocation package and help to locate a suitable apartment.

OCC Computer Personnel
Fleetwood Rd, Nantwich, Cheshire.
Tel. 0570 627 405

Specialists since 1971 in UK and international computer and technical appointments.

SWITZERLAND MAINFRAME SOFTWARE ENGINEERS

Our client is introducing a new high-level language for large scale Software productions. An additional programmer is required to develop Software tools, debugging systems and utilities. Successful candidates should have a degree in Computer Science, 2 years' of IBM or UNIVAC, used modern high-level language and have been involved with large Software development projects.

SATELLITE COMMUNICATIONS BEDFORDSHIRE

A Software engineer is required by our client to join a small team developing this new and very exciting area of communications. Candidates should be in their mid to late 20s, a background degree in electronics or related subject, 2 years' experience of assembler plus a high-level language and ideally a mixture of PDP11 and INTEL experience.

SCIENTIFIC PROGRAMMERS LONDON

An expanding division of a well-known Software House have immediate openings for the following projects:

Real Time Simulation Process Control, CAD Commercial + Control and Mathematical Modelling. Successful candidates should have one or more of the following: Minimum 2 years' Software Programming, RDP11, RSX11M, VAX 780, ASSEMBLER, CORAL 66, RTL2 and FORTRAN.

SWITZERLAND GERMAN-SPEAKING SOFTWARE ENGINEERS

A major communications company require additional German-speaking programmers, to develop new communications Software. Candidates should have a minimum of 2 years' Real Time experience in this field.

HARDWARE ENGINEER BEDFORDSHIRE

Satellite communications is our client's specialty. They currently wish to employ a Hardware Engineer with a minimum of 3 years' experience in industry. A degree background is necessary plus some involvement in Software Hardware experience of PTL and ECL design on micros would be ideal.

ASHFORD SOFTWARE ENGINEERS

A company dedicated to Communications Systems is currently seeking engineers with a variety of the following:

- | | |
|-------------------|-----------------|
| IBM/ICL PROTOCOLS | V25 |
| DEC/RSV11/VAX | DEFENCE |
| CORAL | INTEL 8086 |
| NETWORKS | PROCESS CONTROL |
| EMULATORS | |

FRANCE - IBM SYSTEM PROGRAMMERS

One of France's largest Computer Services Companies have openings for IBM Systems Programmers to work on a variety of our client's installations in a Systems engineering role.

Knowledge of French would be helpful, though a willingness to learn French is essential. Technical experience must include a minimum of 2 years' MVS experience plus related Software Tools.

OPERATIONS RESEARCH PROGRAMMER/ANALYST

Our client's London-based operational Research/Scientific Systems group is currently seeking programmers with the following expertise:

- | | |
|------------------|--------------------|
| FORTRAN | IBM |
| MVS/TSO | Honours Degree |
| Min. 2 yrs' exp. | Financial Planning |

REAL TIME SOFTWARE SPECIALIST SURREY

We are seeking applicants with several years' experience of Software Design. An implementation of Real Time processing. Ideally candidates will have experience of Field Support, Radar Systems RSX11, RTL2, Degree and high- and low-level languages.

MIDDLESEX SOFTWARE DESIGNERS

An expanding division of a Software Engineering Company specialising in mini- and micro-based systems require additional designers. The company is developing several new projects in the Scientific and Engineering field and have exciting opportunities to offer. Candidates with at least 5 years' experience in one of the following areas:

Process Control, Defence Systems, Communications, PDP11, INTEL.

COMMAND & CONTROL LONDON

One of the largest International Software Houses with their headquarters in London have a requirement for Software Designers with a minimum of 1 year's experience in Real Time Systems Design. Candidates should have a degree plus experience in one or more of the following:

- | | |
|-----------------|------------|
| Defence Systems | CORAL |
| Naval | VAX |
| PDP11 | INTEL 8086 |

All the above appointments involve permanent positions and carry a wide range of salary and conditions dependent on location and experience. In the first instance please send us a copy of your CV (alternatively telephone for an application form) so we may discuss your application in confidence with our client on your behalf.

DATAMATICS
RECRUITMENT SERVICES
01-399 9183
Datamatics, Freeport, Surbiton, Surrey KT6 5BR

ComputerWeekly

SPECIAL FEATURE OPPORTUNITIES IN SALES & MARKETING March 25 issue

If you are looking for professional Sales and Marketing people, then Computer Weekly is the journal you need, because Computer Weekly reaches more sales people than any other weekly computer journal.

The March 25 issue provides an added bonus with our special editorially supported feature, highlighting the career opportunities for sales professionals. This is just one of many career-linked features to be published during 1982 aimed at helping readers improve their careers, and at the same time provide invaluable back-up for advertisers.

Whoever you are looking for Computer Weekly is your best communication link with skilled computer people. Analysts/Designers, Programmers, Operators, Sales Executives — we reach more than our nearest competitor. And it's best for those top jobs too with over 32% of readers holding senior/managerial positions.

To reserve space for the
Sales & Marketing feature
phone (01) 661 0121 today.

Copy deadline is Monday, March 22.

ComputerWeekly

Classified Department, Quadrant House, The Quadrant,
Sutton, Surrey SM2 5AS.

CONTRACTS Middle East. Tax free + bonus and benefits*

UK contracts also available

We have contract positions open with our clients now and additional people will be needed throughout 1982. Contact us now to register. Current vacancies are for people with extensive IBM experience.

Programmers + Analyst Programmers

MARK IV - Financial Systems
PL1 and COBOL - Experience of Payroll + ISO/SFF and JCL
MARK IV - Industrial Systems, knowledge of Data Base + Utilities
FORTRAN - for Engineering applications, knowledge of MVS,
PL1 and COBOL - Material Supply Systems using IMS.

Business Analysts

People with substantial experience as Business Analysts are required for the UK and Saudi Arabia. Applications include: Housing Management Systems, Transportation Systems and Material Supply Systems. Experience of both on-line and off-line systems required.

Also required:

Instructors, Software Librarian,
Systems Programmers and Change Control Analysts
For most positions we will require at least three years relevant experience. Middle East contract benefits include:

- | | |
|-------------------------------------|---------------------------|
| * Five day working week | * Overtime payments |
| * Excellent recreational facilities | * Meal allowances |
| * Regular return flights | * Free accommodation etc. |

PERMANENT UK Management Consultants required for Central London location with ability to communicate at a very senior level. Five figure salary. We also have current requirements for permanent staff to work in the Essex area.

Contact Mike Mead at
International and Middle East
Recruitment Specialists
Princes Caroline House,
1 High Street, Southend-on-sea,
Essex S84 1JE.
or telephone Southend-on-sea (0702) 333516
(24 hr answering service).

IMERS

You will have a great future ...but not with us!

We make no bones about it, we are offering you a dead-end future.

Nothing new in that you might say, even though it may be unusual to hear it admitted in an advertisement.

So why the honesty? Fortunately, we have to admit that the dead-end future is not a foregone conclusion.

In 13 months time, our client will no longer exist. They will have been absorbed into a new organisation, with whom are opportunity for people to develop their and sophisticated computer systems.

The current DP staff will form the nucleus of a new department of committed and highly skilled DP professionals, who will have tremendous scope to develop the systems of tomorrow.

So, onto the positions.
SENIOR ANALYST c£12,000

Not only will you deputise for a very overworked DP Manager, but you will control the analysis and be given a remit to successfully implement a major and

critical on-line database system comprising in excess of one million records.

Knowledge of this system will prove to be the basis from which significant new system developments will evolve.

SENIOR PROGRAMMER c£10,000

You will have the heavy responsibility of managing and directing a team of three programmers to enable the successful implementation of this system to take place.

You will therefore be at exactly the right place at the right time to take advantage of the significant systems development plans.

The hardware is based on an IBM 3081 running under MVS JES2 with Adabas as the database.

Programming is in COBOL. However you look at it, the future will be a good one.

How good will be seen when you have replied to this advertisement, and received and read the package that we

will send you.

Unusual career moves require unusual action — so apply!

We look forward to discussing these opportunities with you in more detail.

Initial interviews can be conducted up to 8.00pm each evening, or on Saturday mornings by appointment.

Please send an Application Form and Company Profile to:

0422
Recruitment Consultants

Surname _____
First names _____
Full address _____
Position applied for _____
Home tel _____
Work tel _____ Ext _____

RUB MANPOWER SERVICES LTD
FREEPOST 24, London W1E 6JZ
Telephone 01-438 8891 (24 hour answering phone)

Technical Support S/W

W. M'sex to £13.5K + car

Take this opportunity to join one of the most successful computer companies of our time. You will need several years technical software experience to include: real time, data communications and/or database systems. Analysts with banking or financial systems experience would also be of interest. You cannot fail to be impressed by this client. Higher salary but no car for City Office location.
Contact Terry Harvey.

Applications Support

H. Counties c. £11K + car

Two experienced support specialists are required for a very successful financial modelling and management information package running on S/34 and S/38. Candidates should have previous user support experience, accounts knowledge and interactive computing experience. Central London base but mostly working from home, you will need to be resourceful. Pre & post sales, installation and training responsibilities.
Contact Tim Bridges.

Tech. Micro Application

N. Bucks £8K to £11K

A small, high calibre development team working on the application of micro processors to industrial and scientific measurement and instrumentation is seeking a software person with a good hardware understanding of architecture and machine interfaces. Experience with I.E.E.E. 488 interface, 8080/85 and Intel MDS 800 kit, plus programming in Assembler and PLM would be advantageous.
Contact Terry Harvey.

Analyst Programmer

Herts. to £10,000

A fast expanding computer manufacturer has an opening for an analyst/programmer to work in its own internal DP department. Preference will be given to candidates of graduate level with over one years experience preferably in Basic but training will be given where necessary. A current driving licence is essential for visiting different company locations.
Contact Tim Bridges.

DEC Project Managers

S. Beds to £12,500

There are openings for two Project Managers in this expanding scientific development group. The client is a subsidiary of a large international manufacturer of scientific instruments. DEC/RSX-11 is used in a control and executive mode at the centre of complex computer and instrument systems. A scientific qualification with DEC and supervisory experience would be advantageous.
Contact Terry Harvey.

Compilers Op. Systems

Herts. c. £8,500

An interesting and unusually attractive opportunity has arisen for a programmer with 12/18 mths. experience on micro or mini based systems software. The successful candidate will be required to join a small team of specialists, writing compilers and operating systems. Our client is a leading US company now expanding its UK operation.
Contact Tim Bridges.

Technical Support H/W

Berks. c. £11K + car

The product range and reputation held by this client has made it a world leader in the highly competitive and expanding field of data communications. Candidates must have detailed technical knowledge of modems, multiplexers, data concentrators etc., plus a suitable client relation manner. Product training provided. An excellent opportunity for advancement.
Contact Terry Harvey.

Networking X.25 L.A.N.

Beds/Herts. £10K-13K+

You will be an experienced data communications person, probably with a background in binary protocols. In more recent times you will have been involved in X25 projects and be up-to-date on recent developments in networking. Tasks vary from internal consultancy to team leader responsibility for design and implementation. Positions are with expanding engineering development groups.
Contact Terry Harvey.

Control Systems S/W

Beds. £8K-£11K

Our client specialises in computer controlled industrial applications and mechanical handling processes using PDP11, RSX11 and Intel microprocessors. Projects are varied and interesting with limited site installation and testing. Candidates need to be self starters and experienced Assembler, level programmers. This is a small, growing company with prospects for promotion dependent on merit.
Contact Terry Harvey.

Tech. Analyst Banking

London. c. £12K+ + +

A major international bank operating twin IBM 4341s is seeking a Technical Analyst. The person appointed will be responsible for liaison between systems programmers and the operations department to ensure the smooth introduction of new systems onto the bank's computers. Very thorough knowledge of DOS/VSE and CICS/VM needed. Low mortgage, free meals, season tickets etc.
Contact Tim Bridges.

Write, or telephone us during office hours as below.
Any other time call Terry Harvey on: Great Missenden (0246) 4705, Tim Bridges on: The Lee (024 020) 502.
We are always ready to discuss these and many other interesting positions.

HR

H. R. Associates Limited
Executive, Company and Technical Personnel Consultants
113 House, 118 Avenue, Amersham, Bucks. HP6 5BQ. Tel. 02403 28383
London office: Regent Street W1

HR

R&D and CUSTOMER LIAISON STAFF FEELING BLUE



Let down? Is the recession getting to you? Why not add the excitement of working for a fast moving dynamic computer company

WE ARE LOOKING FOR:-
- Research & Development Engineers
- Project Leaders
- Senior Systems Programmers
- Programmers
- Junior Programmers

to work out of our very modern Brighton office complex.
Experience required on design/development of mini and micro systems, in particular on 8080/286 and 8085/86 systems for the more senior positions. At junior level, a reasonable degree of experience with assembler languages is required.
Communications experience would be advantageous.
Projects include:-
- High Level Language Development
- Communications and Networking
- Automated Office Systems
- File Processors

WE ARE ALSO LOOKING FOR:-
- A Project Manager for both our Rugby and Maple Cross locations
- Project Controllers (throughout the U.K.)
- Post Sales Analysts (throughout the U.K.)
- Programmer - experienced in Micro

Processors with at least one years experience in Assembler Programming to work on a new and exciting range of micro based products in Brighton.

We offer the normal benefits associated with a national company together with more than competitive remuneration

PLEASE CALL: Miss LINDA SIMPSON on Brighton (0273) 413211 to find out more about these exciting opportunities or write with your C.V. to Miss Simpson, (0273)

ABS Computers Limited, North Street, Brighton, Sussex BN1 1ER



SENIOR SALES EXECUTIVE (PERIPHERALS)

LONDON AND HOME COUNTIES

c. £20K + car

Our client, a leading manufacturer of matrix, daisy wheel and band printers, seeks a sales executive to join their expanding and successful team. As it is the company's policy to promote to management level from within, the applicant should have the presence and determination to subsequently lead by example.

Although it is preferable that your experience has been gained within the computer industry, consideration will be given to those applicants with a proven record in business equipment or office product sales.

For further information contact Brian Mawdsley quoting Ref: 5783.

Lloyd Chapman Associates

123, New Bond Street, London W1Y 0HR 01-498 7761

THE COUNCIL OF THE EUROPEAN COMMUNITIES - BRUSSELS

is holding an open competition to both recruit immediately and create a reserve list for the following professionals:

PROGRAMMERS

To be responsible for preparing, writing and testing programmes on administrative and output monitoring procedures using medium sized configurations in real time or in batch processing modes - with access to a database.

DATA-PROCESSING APPLICATIONS MANAGERS

To be responsible for the general operation of a third-generation computer. This will entail introducing modifications into existing applications programmes, writing simple supplementary programmes, preparing check sequences or adapting them to the hardware possibilities as well as checking the execution results and checking databases.

In both cases, the main qualifications are an education to 'O'/'A' level (standard or the equivalent work experience, at least three years' professional experience in one of the above mentioned fields and a knowledge of two programming languages - one of which should ideally be COBOL-ANS. The date of birth of all applicants must be after 31st December 1941.

The conditions of employment with the Community in Brussels include:

* A net monthly salary (after all deductions for social security, income tax etc.) of between BF 68,000 (around £708) and BF 69,500 (around £766) - including an expatriation allowance.

* Family allowances - where applicable.

To obtain a copy of the notice of competition and the compulsory application form, please write (preferably on a postcard) to: Services du Personnel - Secrétariat, Général du Conseil - rue de la Loi 170 - B 1048, Brussels.

The closing date for submission of the official application form is the 15th of April 1982.

SALISBURY DISTRICT

COMPUTER MANAGER

Around £11,000 + Benefits

This vacancy in our Treasurer's Department offers an exceptional opportunity to manage and promote a medium sized ICL installation with a District Council committed to major development.

In the last year we have installed a one megabyte ICL 2946 (DME/Exec 5S, 23 VT's and two linked 7700 word processors) and introduced the packages MINIMAC, GPG, Find-2, Wordskill Manager, HOMEREP and PLANAPS. Attention is now switching to in-house development plus expansion into on-line cash receipting this summer.

We are looking for someone with: management experience or considerable potential; comprehensive experience of ICL equipment and systems (plus awareness of Mr. Wilmore's developments); a sound knowledge of COBOL and T.P.; a committed approach and the personality to promote this installation to encourage users.

We offer flexible working hours, 26 working days holiday, car loan facilities, and reduced rate membership of BUPA. Assistance with relocation expenses and housing may be available.

Contact the Personnel Officer, Salisbury District Council, Bourne Hill, Salisbury, Wiltshire, SP1 3DZ (Telephone 0722 6272 Ext. 278) for an application form and further details. Closing date: 25th March, 1982. Interviews to be held on 29th March, 1982.

Management Services Manager

Peter Lord Ltd. - Somerset

Peter Lord is a chain of 200 shops/concessions and is part of C. & J. Clark Ltd., one of the UK's largest private companies.

We currently operate Dual Univac 90/30 machines, one batch processing, the other primarily on line systems. We also pull two shops where P.O.S. equipment is installed.

We are looking for a high flying computer professional (male or female) who can have considerable impact on the running of our business. Knowledge of P.O.S. systems and communications is desirable as much development is planned in this area. Likely age range 25 - 35 years.

Remuneration package will not be a problem for the right candidate and includes car, B.U.P.A. cover, Non-Contributory Pension and Bonus Scheme.

Interested? Then please write or telephone in confidence to:- Monica J. Watson, Personnel Manager, Peter Lord Ltd., P.O. Box 2, STREET, Somerset BA16 1YH. Telephone (0458) 42131 ext 2075.

0818

Peter Lord



FIELD ENGINEERING

LONDON - BIRMINGHAM - SURREY, HANTS, ESSEX, HERTS.

Recognition, security and real job interest are common denominators in the following positions offered by our clients - all leaders in their areas of expertise.

SUPERMINIS - LONDON, BIRMINGHAM £11K + Car

++++
Solvent member of respected 32% group - actively broadening its range of applications - growing at more than 50% and boasting the fastest processor in its field, our client seeks enthusiastic engineers ready to progress to support.

MINIS - LONDON, HANTS, BIRMINGHAM - £9.5K + Car + Bonus, etc.

Quoted in recent Trade Press as being the most exciting manufacturer to appear during the last ten years. Fabulous kit, new team, astonishing growth - full product training will add strings to your bow.

MICROS - LONDON/SURREY/ESSEX £9K + Car + O/T + +

The names in British Micros - growth of excess of 200% p.a. and on the incline - very powerful but competitively priced kits has established this company as a market leader, their young and dynamic services team is able to offer full training (B/W as well) and unrivalled career opportunities to Engineers with peripheral experience (280 an advantage). Call Keith Wallis to discuss the above positions or field opportunities in general NOW!

(0411) 4841 or 04865 3014

ALLTRONICS PEOPLE (AGY)

01-5414841 or 04865 3014

BUSINESS SYSTEMS CONSULTANTS

LONDON and LEEDS

We are a Burroughs class one Software house with offices in Windsor and Leicester. As part of our planned expansion we now wish to appoint:

BUSINESS SYSTEMS CONSULTANTS

to be based in the London and Leeds areas. The successful applicants may have a manufacturing background and will be familiar with current computer hardware, preferably in the clothing or textile industries.

The job function will involve systems development, extensive client contact and the building of a user base in the North of England.

An initial remuneration package at least equal to current earnings is offered and the successful consultants can expect an excellent career progression.

Applications, which will be treated in the strictest confidence, should be addressed to:

David Lloyd
UNIVERSAL CMS LTD.
Victoria House, Albert Road
Old Windsor, Berkshire, SL4 2PZ
Tel: Windsor (07535) 54587

COMPUTER PROGRAMMERS/ANALYSTS

Applications are invited from computer programmers/analysts for a post of PROJECT ASSISTANT within the Clinical Information Science group in the university department of Surgery (St. James's Hospital, Leeds) for work on a national Computer-Aided Diagnostic Project. The post is available immediately for a fixed term of up to three years with possible continuation thereafter. Applicants should have a degree, preferably in computing or statistics.

A good knowledge of micro-computers, including PET and APPLE, is required (in particular experience with BASIC systems and file handling systems run on BASIC computers).

Informal enquiries may be made to Mr. F. T. de Dombel 10532-33144 ext. 5668.

Application forms and further particulars may be obtained from the Registrar, The University, Leeds LS2 9JT, quoting reference number 110/2. Closing date for applications 25th March, 1982.

(0755)

CONTRACT PROGRAMMERS

• Honeywell DPS462 COBOL LONDON
• OL1 COBOL - OS/VS2 MVS BEDS.
• Data general COBOL - AOS/VS LONDON
Info: 2 essential SURREY
• IBM 8100 DPCX

IMMEDIATE STARTS
Please contact JACKIE REDBIBNS

(0829)

FORCE 8 computer services

8 Mint Walk Croydon 01-680 3761

PDP BASIC + 2 EXPERT

East Anglia £10,500 - £11,000

Our Client, a successful services company specialising in Turnkey and Time Sharing Systems on DEC equipment, seeks to recruit a self-motivated ANALYST/PROGRAMMER to play a significant role in the growth of their company.

The candidate should ideally have a minimum of 5 years' DEC experience covering BASIC+2, RSTS/E and RMS-11.

To be successful, your application should have covered SALES ORDER PROCESSING, STOCK/PRODUCTION CONTROL and MANAGEMENT ACCOUNTING.

This position carries a high percentage of on-site work so candidates must be prepared to travel.

The company is offering an excellent salary, good career prospects and a very stimulating environment.

For more information, ring SHIRLEY-ANN FRANCIS on 01-498 7761 during office hours or 01-542 2538 after 7 p.m. quoting ref: 0012.

0270

CL EXECUTIVE 01-499 7761

IDS

Unique Opportunity for System 34/38 Analyst/Programmers

London Based

to £16K

Our Client, Interactive Database Systems Limited, is a small well established and extremely successful software consultancy specialising in the development and implementation of sophisticated packages for financial institutions.

Due to rapid business growth, they urgently seek two Analyst/Programmers to join their banking team. Specialising in the installation and support of the IBIS 38 System, custom designed for the IBM System 38 and currently the most advanced and comprehensive banking information system of its kind, ideally you will have:

- * A minimum of 2 yrs RPG II Exp.
- * Sound Knowledge of System 34/38.
- * Experience of financial/banking applications.
- * Enthusiasm, self-motivation and ambition.
- * The ability to communicate with users.
- * Organisational skill to utilise time effectively.

If you would like to play a significant role in the future success of this dynamic company and enjoy a generous salary, contact AMANDA BARSHALL on 408 1670 or 328 1606, quoting ref: 6015.



Lloyd Chapman Associates

123, New Bond Street, London W1Y 0HR 01-498 7761

(0708)

DATA COMMUNICATIONS SPECIALIST

South Yorkshire Package to £12K

£14K for exceptional experience and ability

In addition our Client requires ...

In the first instance, applicants for all positions should contact JEFF WALTON on 061-236 7026 (daytime) or on 061-982 0002 (evenings and weekends).



Insight Marketing & Personnel Consultants

Austin House, Charlotte St., Manchester 1 Telephone 061-236 7026

24 hour answering service



DALROTH computer personnel

Product Development Manager

CENTRAL LONDON

Salary range £15-20,000

A leading multi-national software house with associated distributor worldwide is seeking a Manager to run their European Data Centre Product Development Group. Parallel department functions exist in the areas of Product Planning and Education, Technical Communications and Marketing Communications.

The Company are market leaders in IBM OS & DOS Data Management and Data Dictionary products. They have an in-house data centre with approximately £400K of hardware and are seeking an effective Manager capable of running a group of approximately 25 Designers and Programmers working on a number of development projects. The personnel resource budget is approximately £1 1/3 million p.a.

This position entails overall technical responsibility as well as project and budgetary management functions. You will also have to ensure cross product integration and compatibility in a family of dictionary driven products. An effective communicator is essential to ensure ongoing user liaison.

If you have a proven track record in the management of IBM development projects and are strong enough to take on this significant level of responsibility please telephone either Jenny Dalrymple-Hay or Roger Allington on 01-493 2947 during the day, or respectively Beaconsfield (04948) 4579, Little Gaddesden (044284) 3536 (evenings/weekends), quoting reference 9898.

DALROTH & PARTNERS LTD 4 HALF MOON STREET LONDON W1

(0804)

Our clients, a successful European Computer Manufacturer, have embarked on a major expansion programme in the U.K. As part of this, they are committed to establishing a major presence in South Yorkshire. Additional specialist systems and software personnel are therefore required to take advantage of these superb ground floor opportunities which have excellent career prospects.

The Data Communications Specialist will provide Technical Support to customers and colleagues mainly in a Post Sales environment (although some Pre-Sales work may be involved). Major areas of responsibility include:

- Data Communications Software
- T.P. Monitor Software
- Associated Hardware

The successful applicant should have at least five years DP experience in a Technical environment with at least two years' experience of developing and supporting large Data Communications Networks. He or she should possess skills in some of the following Data Communications areas.

- Knowledge of Data Link Protocols
- Writing Data Communications Software
- Understanding the functions of Hardware Components
- Use of Testing/Fault Finding equipment e.g. DataScope

SENIOR SYSTEMS DESIGNER - TO £12K

Experience in the design of screen based systems and a thorough understanding of file design is essential.

OPERATING SYSTEM SPECIALIST TO £10K

Technical Support experience and Operating Systems background on mini-computers required.

PROGRAMMERS - TO £7.5K

Experience in COBOL and/or ASSEMBLER.

Design Engineer

Bucks £9K-£11K

We are currently seeking a professionally qualified Design Engineer to work in a senior capacity for a prestigious communications manufacturer. Applicants must be capable of demonstrating their utilisation of both Analogue and Digital design techniques together with, ideally, a background in active-filter design. Ref: 5746.

Customer Support Engineer

Home Counties up to £8,500 + Car

Our Client is an established Data Terminal manufacturer looking to increase its field engineering resources. Customer Support Engineers are required to maintain an existing range of terminals, VDU's and micro-processors, faulting to component level, in an area encompassing North and East London postal districts and surrounding counties. Initial product familiarisation will take place at the Head Office in the South West. It is likely that the successful applicant is currently enjoying either a field service role or seeking a move to field engineering from R & D, and is qualified to at least ONC level in electronics. Ref: 5775.

Field Service Engineer

London up to £7,000 + Car

To meet the demands of steady growth, our Client - a leading manufacturer in the field of computer peripherals - is in the process of recruiting an experienced Field Service Engineer. Ideally candidates will be in their mid-twenties and familiar with the faulting of data terminals, VDU's, daisy-wheel and matrix printers to at least board-level. Although emphasis is placed on relevant experience, a formal qualification would be an added bonus. Ref: 5773.

For further information please contact Robert Hargrave quoting the appropriate reference.



Lloyd Chapman Associates

123, New Bond Street, London W1Y 0NR 01-499 7761

JOIN THE MARKET LEADERS

Due to rapidly expanding business opportunities, we are looking to increase our expertise and the services we offer to our clients in Europe. We thus require the following additional staff:

EUROPEAN SUPPORT REPRESENTATIVE

You will lend your skills to the support of an established European distributor network for our range of communications storage devices. A hardware background, experience in communications and in both pre-sales and post-sales environments is essential. You will need to be disciplined in your approach and be self-motivated. The ability to speak a foreign language would be advantageous.

SOFTWARE DESIGNERS

These are two senior appointments, one of which will be as the assistant to the present European Software Manager. Candidates will bring to these positions their experience on 8502/6809 design, as well as micro-processor applications and experience at both Assembly and high level.

Successful candidates can expect a five figure salary and good fringe benefits. Please apply in writing, enclosing a c.v. to:

SYKES DATATRONICS LTD
REGAL HOUSE
LONDON ROAD
TWICKENHAM
MIDDLESEX TW1 3QT

(0712)

C.A.D./M. Systems Management

A vacancy exists within our CAD/M team. The job will involve the use of our existing five terminals (ComputerVision) for CAD together with the link to CAM on two CNC Milling Machines.

Key areas of the job will include management of the systems standards, writing of software, training of new operators and assisting with demonstrations of the equipment.

The position will be particularly suited to a man or woman with an engineering background and computing skills. This will enable an effective contribution to be made to Engineering operation which is involved in the design and development of instrumentation and systems of cars for the future.

Please write with brief career details, including current salary, to David Bagshaw, our Personnel Officer at the address below.

ais SMITHS INDUSTRIES
automotive instrument systems Ltd.

317 Edgware Road, Crickwood, London NW2 6NN.
A SUBSIDIARY OF SMITHS INDUSTRIES PUBLIC LIMITED COMPANY

Microcomputer/Word Processing

Towards Sales Management

£14-18K + Potential with basic & car

Our Client is a sales and marketing oriented business computer system company who have from scratch in the last two and a half years created a turnover in excess of £1.6M. Professionally managed, they are leaders and agents for a number of highly successful hardware and software products aimed at solving small business users' problems.

There are two requirements, the first for Sales Professionals who must be self-motivated, professional salesmen with ambition to run their own branch. Not necessarily having a computer sales background but being able to demonstrate the ability to generate their own marketing action. Strong on empathy and drive. Areas: Norwich, Cambridge and South Essex.

A Product Development Manager

The Second a Product Development Manager who will ideally have software selling/marketing experience and be creative and pragmatic in his/her marketing approach, coming from a computing or allied background. Market sympathetic, able to evaluate new programmes and select and prepare product launches based on sound research. Then orchestrate the launch, conduct dealer training, organise all associated marketing action and material. Based Colchester.

We have prepared comprehensive job specifications and client profile which we shall be pleased to send to suitably experienced candidates. In the first instance, please phone David Anderson on 01-824 1044 quoting reference 472F or 473F respectively, or write in confidence to Trojan Engineering Services, Forest House, 160-168 Station Road, Chingford, London E4 6AN.

Trojan Advertising

Recruitment Selection Consultants

Job Vacancies

Computer Weekly reaches more Systems Engineers

than any other computer publication.
Ring 01-661 0121 for the facts

Computer Weekly
BREAK THROUGH TO THE COMPUTER PROFESSIONALS WITH
Computer Weekly

SURREY EDUCATION COMMITTEE NORTH EAST SURREY COLLEGE OF TECHNOLOGY

Regate Road, Ewell, Surrey KT17 3DS

Required from 1st May, 1982 to join a group of staff concerned with the teaching of computing and data processing throughout the College.

Lecturer 1 in Computing (Data Processing)

Applicants should be competent programmers with a sound knowledge of COBOL together with teaching/business systems experience. A formal qualification in computing is desirable.

Included in the teaching duties will be the provision of computer education for students studying courses leading to:

C & G 746 Sase Certificate in Computer Programming
BEC/TEC National Certificate/Diploma in Computer Studies
BEC National Certificate/Diploma Computing options

Stamped addressed envelope please for further particulars and application forms from the Vice-Principal.
Salary: LECTURER 1 £8,034-£8,668 p.a. plus £210 p.a. London Fringe Allowance. Generous relocation expenses in approved cases.

Senior Software Specialist

DEC VAX/VMS

£10,500 + profit share South West

Our client is the leading European company in the design and manufacture of electronic Automatic Test Systems. Their continuing expansion worldwide has created a career opportunity for a specialist to take responsibility for the specification, design and implementation of a multi-processor communications network.

The ideal candidate will be experienced in computer communications within the engineering or computing industry and possess a good knowledge of DEC VAX/VMS. The prospects for career progression within a rapidly expanding company in a high technology environment are excellent. The benefits package includes a generous profit sharing scheme, 24 days holiday, free life assurance, pension scheme and an excellent relocation package to a pleasant part of the South West with exceptional educational, social and leisure facilities.

Please call in strict confidence Newbury (0635) 48709 for an initial discussion or write, quoting reference 512/BR, to:

LPS

Larkfield Personnel Selection

55 Northbrook Street, Newbury, Berkshire RG13 1AN Telephone Newbury (0635) 48709

Computer/Electronic Engineers- Looking for a career step?

Rediffusion Computers Ltd., world leaders in videotex and advanced office systems, are seeking staff to join their customer services department based at Crawley and Kingston (although occasional short trips abroad are a possibility).

Technical Support Engineers - one based in Crawley one based in Kingston

To provide second level support to our customer engineers. You should have at least 5 years' practical knowledge of mini and micro computers with peripheral experience on storage discs, tape units and VDU's. Applicants should either have formal qualifications up to HNC in electronics/computer studies or possess relevant experience.

Engineering Hardware/Lecturer - based in Crawley

To train company and user engineers on all aspects of Rediffusion Computers. You will have at your disposal the benefits of our fully equipped education centre. The ideal applicant should have at least 3 years' experience working in the computer/electronics field plus relevant qualifications. Although the ability to communicate is essential full training will be given on company products and where appropriate, on teaching techniques.

These positions offer an excellent opportunity to join an expanding company with good career and salary prospects. Relocation will be provided if appropriate.

For further information or application form please contact:
Rob Wilson, Personnel Officer,
Rediffusion Computers Limited
Kelvin Way, Crawley, West Sussex RH10 2LY. Tel: (0293) 31211.

REDIFFUSION Computers
A Member of the Rediffusion Group of Companies

RECRUITMENT CONSULTANT

Recruitment and Contract Consultancy
London & Brussels £15000 - £30000

Established seven years ago, Datascene is one of the leading companies in providing Advertising Recruitment and Contract Services. In a planned expansion programme we have just opened a branch office in the centre of Brussels to expand our operations in Europe. Further plans are envisaged to open further branches in the near future.

We are currently looking for four to five members to join our highly successful team with the following background:

- A proven track record as sales executives in the computer services field.
- Aged over 25 with a good educational background.
- The ability to communicate at all levels.
- To communicate in French, verbally and in writing (for Brussels position).

We offer high basic salaries, an incentive commission which includes an initial guarantee, PPP medical insurance and Company car. Incomes can vary from £15000 to £30000 dependent on success.

For further information please contact Mike Oakes.

Datascene
International
Limited
Sceptre House 169/173 Regent Street London W1R 7FB. Telex: 25851.

datascene

01-439 7871
24 hour answer phone
London & Brussels
Sceptre House 169/173 Regent Street London W1R 7FB. Telex: 25851.

BRIAREED LTD RECRUITMENT CONSULTANTS

LONDON - SOUTH - MIDLANDS - NORTH

WE HAVE BEEN RETAINED BY A LEADING BRITISH COMPUTER PUBLIC COMPANY TO OBTAIN
SALES STAFF FOR THEIR RAPIDLY EXPANDING BUSINESS

THE PRODUCTS ARE HIGHLY COMPETITIVE BUSINESS SYSTEMS WITH COMPREHENSIVE SOFTWARE PACKAGES RANGING IN PRICE
FROM £6,000-£120,000. THERE ARE OVER 2,000 U.K. INSTALLATIONS

COMPUTER SALES MANAGERS MAJOR ACCOUNT MANAGERS

LONDON - SURREY - WEST MIDLANDS - EAST MIDLANDS

SALES MANAGERS WITH AT LEAST 2 YEARS' EXPERIENCE OF MANAGING A GROUP OF HIGHLY MOTIVATED COMPUTER SALESMEN, IN EACH OF THE ABOVE LOCATIONS.

- ★ REALISTIC TARGET EARNINGS IN EXCESS OF £21,000 PER ANNUM
- ★ GUARANTEED INCOME FOR SIX MONTHS
- ★ 2 LITRE OR 1.8 LITRE COMPANY CAR
- ★ NON-CONTRIBUTORY PENSION SCHEME
- ★ FREE SUPA CONTRIBUTIONS
- ★ PRODUCT AND SALES TRAINING GIVEN

COMPUTER SALESMEN

LONDON - HOME COUNTIES - SOUTH - NORTH - MIDLANDS

SALESMEN WITH AT LEAST 2 YEARS' EXPERIENCE OF SELLING COMPUTERS OR BUSINESS SYSTEMS SUCCESSFULLY TO COMMERCE AND INDUSTRY ARE REQUIRED IN THE ABOVE LOCATIONS.

- ★ TARGET EARNINGS £20,000 PER ANNUM
- ★ GUARANTEED INCOME FOR SIX MONTHS
- ★ 1.8 LITRE COMPANY CAR
- ★ NON-CONTRIBUTORY PENSION SCHEME
- ★ PRODUCT AND SALES TRAINING GIVEN

DEALER LIAISON SALESMEN

LONDON - NORTH - SOUTH

COMPUTER SALESMEN WITH EXPERIENCE OF APPOINTING AND NEGOTIATING WITH DEALER OUTLETS RESPONSIBLE FOR SELLING COMPUTER SYSTEMS TO BUSINESS AND INDUSTRY.

- ★ TARGET EARNINGS £20,000 PER ANNUM
- ★ GUARANTEED INCOME FOR SIX MONTHS
- ★ 2 LITRE COMPANY CAR
- ★ NON-CONTRIBUTORY PENSION SCHEME
- ★ PRODUCT AND SALES TRAINING GIVEN

TRAINEE SALESMEN

LONDON - HOME COUNTIES - SOUTH - NORTH - MIDLANDS

YOUNG PERSONS ARE REQUIRED WITH DEGREES OR EQUIVALENT QUALIFICATIONS IN THE FOLLOWING:

BUSINESS STUDIES
ACCOUNTANCY
BANKING
MATHEMATICS
INSURANCE

FULL SALES AND PRODUCT TRAINING WILL BE PROVIDED DURING THE FIRST SIX MONTHS WITH A GUARANTEED INCOME OF £7,000 PER ANNUM OR AT A RATE NO LESS THAN CURRENT INCOME

- ★ TARGET EARNINGS £12,000 PER ANNUM
- ★ COMPANY CAR
- ★ NON-CONTRIBUTORY PENSION SCHEME

SYSTEMS ADVISERS

LONDON - HOME COUNTIES - MIDLANDS - NORTH

PRE SALES - MAJOR ACCOUNTS - DEALER SUPPORT

EXPERIENCE REQUIRED IN COMMERCIAL BUSINESS SYSTEMS AND WITH A FLAIR FOR DEALING WITH FRONT LINE SITUATIONS. TECHNICAL BACKGROUND DESIRABLE.

- ★ SALARY £8,000 + PER ANNUM
- ★ NON-CONTRIBUTORY PENSION SCHEME
- ★ COMPANY CAR

INTERVIEWS WILL BE ARRANGED IN LOCAL AREAS

PLEASE REPLY WITH FULL DETAILS OF CAREER AND EARNINGS TO DATE TO:

DAVID FAIRGRIEVE, M.INST.M.
BRIAREED LIMITED
P.O. BOX 38, LETCHWORTH, HERTS SG6 1QJ.

TEL. LETCHWORTH (04526) 70327

EMJAY COMPUTER SERVICES



ANALYST/ PROGRAMMER £9,000 + CAR

Do you have a good commercial programming background? Our client needs your expertise. Ideally you will have IBM COBOL and have done a fair amount of analysis. For this, they will offer the opportunity to work in a progressive team dealing with problem solving, development and systems enhancement. Sounds interesting doesn't it? Call us.

PL1 PROGRAMMER £9,000

Our client needs your wealth of experience to assist them with a massive amount of development work they are currently undertaking, most of which is on-line. They offer their employees a subsidised mortgage, a bonus and various other benefits. Call us to make an appointment.

CONTRACT IBM DOS OL1 12 months, start APRIL - good rates
Call Lynda Abi or Harvey Kaye on 01-404 4339 or 01-242 0076

PROGRAMMER £7,000-£8,000

WHERE IS YOUR JOB TAKING YOU? Are you a self-motivated IBM COBOL programmer wanting to get more involved. Do you have some GCS or OL1 or would like to learn? Our client can offer you a good opportunity to work in a role where hard work and ambition are recognised and rewarded. Could this be you? Can you offer at least 18 months' experience, if so call us for more information.

IBM DEVELOPMENT PROGRAMMERS up to £13,000

Internationally renowned company currently require IBM ASSEMBLER and/or COBOL to enhance their research and development teams, to qualify for these positions you must have three years' IBM programming experience coupled with an extensive knowledge of a TP monitor such as SHADOW or CICS. For more information, please call us.

COMPUTER SERVICES Recruitment Consultants

London Office: 27 Chancery Lane, London WC2A 3PL
01-242 0076/01-242 4339



ANALYST PROGRAMMERS

We are a highly successful company manufacturing precision engineered products for a world-wide market.

We currently use an IBM System 34 with 13 terminals, a processor of 256K and 256MB disk capacity.

An IBM System 38 is currently under consideration. Existing applications cover financial and production systems with the emphasis on future developments being in the production areas.

Currently various System 34 packages are being analysed to determine their use in our future development programme.

The successful applicant will have had considerable experience in industry to include commercial, financial and production functions and have had at least 4 years EDP experience.

An extensive knowledge of IBM System 34 is required and knowledge of IBM System 38 would be desirable.

A competitive salary will be offered together with the benefits associated with a progressive company. Substantial relocation assistance will also be provided where necessary to this pleasant rural area where housing is favourably priced.

Write for an application form or telephone our Recruitment Officer, Mr. S. Murphy on Grantham (0478) 6577.

British Manufacture and
Research Company Ltd.

Specialist in Robot, PLANT, TRANS, and related NG31 JAR
a member of the British Machine Tool Group

CONTRACTS - NORTH HERTS

Required for 12 month-contracts (approx) immediately.

North Herts company requires Systems Analysts and Programmers with IBM COBOL database experience (preferably IDMS) and a knowledge of on-line systems.

RATES OF PAY £9-£10 per hour

Phone - Hitchin (0462)
813255

Ryman

Salary c.£12,000

Could you establish a retail operation in Micro-Computers? We are a multiple retailer of office stationery and equipment and are expanding into the field of micro-computers.

We are looking for an expert in the field to establish and manage the retail operation, initially in our London branches, and from there developing into a number of locations. Additional responsibilities will include purchasing, sales development, recruitment and training of micro-computer sales staff.

If you feel you could apply your technical knowledge in a retail environment, apply by writing to:
Mrs C. A. Smith, c/o Ryman Ltd, 19-20 High Holborn, London WC2V 6BS.

THE HATFIELD POLYTECHNIC SCHOOL OF ENGINEERING

LECTURER IN/SENIOR LECTURER IN ELECTRONIC/ INFORMATION ENGINEERING

(Re-advertisement)

Candidates should have an Honours Degree in an appropriate discipline and recent relevant industrial and/or research experience is desirable. Applications from those with experience in information engineering will be particularly welcomed. The successful candidate will be required to teach on degree, diploma and post-experience short courses and will be expected to develop research and consultancy activities.

Salary between £8,875 and £11,541.

Application forms and further details may be obtained from the Staffing Officer, The Hatfield Polytechnic, P.O. Box 109, Hatfield, Herts. AL10 9AB, or telephone Hatfield 88100 extension 309.

Please quote Ref: 482.
Closing date: 19 March, 1982.

COMMERCIAL ANALYST

Beas Water & West Limited, a Regional Operating Company of Beas PLC, have a vacancy in their head office at Cardiff for a Commercial Analyst, to assist in the development and implementation of local and Group computer systems.

Applicants should be educated to degree level or equivalent with a minimum of three years' experience, including the implementation of computer based systems preferably in a financial environment. There are excellent opportunities for career development within the Beas Group.

We offer a competitive salary, bonus, contributory pension and life assurance, and other a period of service, free membership of S.U.P.A. with participation in the Company Share Scheme. Applications in writing, stating age, experience and current salary, to:

J. W. McCullough
Personnel Manager
Beas Water & West Limited
P.O. Box 114 N20
Newport, Gwent NP23 5DQ

A member of the Beas Group

WORTHING BOROUGH COUNCIL

COMPUTER PROGRAMMER

(Salary Grade: AP.4-5 - £8,501 to £7,875)

A COBOL programmer is required to join a small team working on the development of a variety of financial and other interesting applications for the Council's I.C.L. 2904 computer.

Candidates must have two years experience of writing on line and batch programs in COBOL and a good knowledge of I.C.L. software.

A good starting salary within the above range will be offered to an applicant with the required level of experience.

Benefits include temporary housing accommodation as well as 100% removal expense and resettlement, lodging and travelling allowances in appropriate cases. Flexible working hours, 24 days annual leave, staff canteen and good social facilities.

Job description and application form available from:

The Computer Manager, Borough Management Services and Personnel Department, Town Hall, Chapel Road, Worthing, West Sussex, BN11 1LE. Tel: (0903) 39988 ext. 242. Closing date: 22nd March, 1982.

ANALYST/PROGRAMMERS

WORKING - £7-9K NEG

HP 3000/III (Upgrade probable)

We require additional persons with HP experience to join our team implementing an Order Processing system using COBOL, IMAGE and VIEW.

Roger Chast
JAMES WALKER & CO. LTD
LION WORKS, MAYBURY HILL
WOKING, SURREY GU22 8EP
Telephone: Woking 6951

Freelancers...

...in the North of England and Scotland who are available now or in the near future are invited to contact us, Peter Moore, to discuss a variety of interesting and rewarding assignments throughout the UK and overseas.

P-E Computer Services Limited

Witcher House, Fountain Street, Manchester M2 2EP. Telephone: 061-226 2776.

TECHNICAL ANALYST/PROGRAMMERS

BAHRAIN

£15,500 TAX FREE + BENEFITS
(single or family status)

Our client is a multi-national industrial company with an extensive range of computing facilities including IBM mainframes, DEC minis, and CAD/CAM equipment.

They now seek to recruit two Analyst/Programmers, one with sound FORTRAN experience and the other with process control experience to work within a small team of specialists on engineering and planning applications. This area is of growing importance to the company and hence offers excellent career progression. Social conditions are good and the company offers a comprehensive benefits package including free furnished bungalow accommodation.

For more details, please telephone quoting REF: 5019.



CL EXECUTIVE 01-499 7761

MICRO SOFTWARE ENGINEERS

Valis of Glamorgan

Salary
c.£10,000

JPM (Automatic Machine) Limited, is one of Europe's leading manufacturers of amusement and gaming equipment.

Expansion in the R&D Function to take on new developments has created vacancies for skilled software engineers. The post requires people to work as part of a young team developing new products to satisfy our every changing market. The post will therefore appeal to professionals with innovative flair and enthusiasm for seeing products successfully through from design to completion.

Ideally, candidates should be qualified to degree level with several years' experience. We will however be interested to hear from applicants without degrees provided they can demonstrate initiative, ability and a suitable background. Experience with TI 9800 series and Zilog minis would be particularly relevant.

Salaries are reviewed annually in September and effort and enterprise duly rewarded. The Company also operates a Pension Scheme.

Please telephone Personnel Department for further information and an application form or send CV.



HADFIELD ROAD
LECKWITH TRADING ESTATE
GLAMORGAN CF23 5LQ
Tel: (0222) 599988

and (Automatic Machine) Ltd.

Software Engineering Specialists

At last the right location for your skills

to £12,000

One of the research and development units of a major and successful electronics group is increasing its design capability.

It is engaged in the resolution of real life problems concerned with ships and the sea primarily in the field of electronic engineering. The challenge is the hardware/software design and development of microprocessor based systems using the latest LSI technology and software engineering techniques. Current hardware includes Intel 8086, T.I. 9900, supported by DEC PDP11's and VAX miniclones.

Hardware/Software Designers to £12,000

Opportunities exist for principal and senior designers who have a minimum of 3 years experience of digital

hardware/software design, ideally in a real time mini/micro environment.

The work will be technically challenging - responsibilities include the specification and design of both hardware and software including special purpose bit-slice processors and sequencers involving microprogram design.

A degree, innovative experience in a defence, process control or communications environment plus technical leadership skills are the key qualities sought.

Programming Team Leaders to £12,000

Three years plus experience of real time program design ideally using Assembler and one or more high level language, e.g. Coral 66, Pascal, Mascal. The successful candidates will assume responsibility for a team of design programmers, therefore the ability to communicate ideas effectively and give a technical

lead will be a selection criterion. A BSc or equivalent is desirable.

Benefits to make your move easier.

Our client can offer an attractive package to suit individual needs. This includes:

- * Estate Agents Fees
- * Solicitors buying and selling fees
- * Full removal costs
- * 2 paid trips to the area for you and your spouse to view property
- * Travelling expenses for you and your family when you move
- * Generous Temporary accommodation allowance.

Other benefits

In addition to the salaries other benefits include good pension and insurance schemes, generous holiday entitlement and free BUPA for principal grades.

If you would like to hear more about our client's growth plans for 1982 contact Peter Hatherley or Colin Hush on 01-938 1804. This location is right for you.

Practical Computing

is looking for a programmer/journalist. Programming and writing skills are equally important but prior experience of journalism is not necessarily required.

The successful applicant will have:

- * Two years' experience of computing
- * Knowledge of at least two computer languages
- * The ability to write clear English

Send a CV and examples of your written work to The Editor,

Practical Computing

Quadrant House, Sutton SM2 5AS

The post will carry a salary of £8,483 (subject to annual review in April).

FOR
CLASSIFIED
ADVERTISING USE

DIRECT
LINE
01-661 0121



AIRLINE INDUSTRY DATA PROCESSING PROJECT LEADER

Geneva-based international organisation seeks DP professional with extensive data processing experience in the area of international airline traffic data to supervise team responsible for all systems related to the processing of fares, rates and mileage information.

Candidate must have a minimum of six years' programming/analysis experience and be fully familiar with all aspects of the appropriate application areas. Thorough knowledge of FORTRAN and COBOL in IBM OS or UNIVAC 1100 environment is required. Must be able to communicate with users and DP staff at all levels. Previous experience in a supervisory position would be an asset.

This position offers a unique opportunity for a person with an interest in this area to play a major role in the provision of traffic data to the airline industry.

Interviews will be conducted in London week of March 22.

Detailed curriculum vitae should be received at the following address no later than March 18.

International Air Transport Association
Greener House
66/68 Haymarket
London SW1Y 4RF

Systems Analysts

Clarks Limited is the largest manufacturer of branded shoes in the U.K.

To give further impetus to the development of a range of new commercial systems, we are now looking for two Systems Analysts.

The successful applicants will work in a progressive IBM installation and will have a record of achievements in the areas of system development and implementation. Experience of order handling routines and/or warehousing procedures would be an advantage.

We offer a starting salary of around £10,000 p.a., together with an annual bonus and non-contributory pension scheme. A full relocation package is available to those who will need to move house to this very attractive part of Somerset.

Please write to John Holdaway, Staff Services Manager, Box 112, Clarks Limited, Street, Somerset for an application form or phone Street (0456) 43131, ext 2661.



Targa

CITY SALES EXECUTIVE c.£15,000 PACKAGE
TCR are looking to expand their small, professional team of consultants by the addition of a Sales Executive. Applicants should be able to demonstrate a good track record in sales of computer hardware, peripherals or associated products. Of paramount importance is the ability to present TCR's recruitment and advertising services on our clients' premises and to close on the high number of leads supplied by our consultants. A generous benefits package consisting of basic salary, negotiable guarantee, health care plan and company car is provided.

PROJECT MANAGER c.£13,000
This leading company in the financial sector require an experienced, self-motivated individual to complement their systems department. The successful applicant will be able to demonstrate a full range of communication skills together with a history of managing and implementing major projects in a large-scale IBM environment. For this senior management position an excellent range of benefits is offered including relocation where appropriate. Ref. R3859

CITY ANALYST PROGRAMMERS c.£10,000
A leading City-based insurance company need to expand their support team. A wide variety of applications are involved and the opportunity for user contact through to implementation is a feature of these positions. Candidates with a good grounding in COBOL or PL/I are required and a knowledge of CICS/DLJ useful but not essential. Excellent opportunities for career progression combined with a benefits package commensurate with a major company. Ref. R3621

CITY ANALYST/PROGRAMMERS £8-£12,000
Vacancies occur at various levels for persons with good BASIC, BASIC +, COBOL, FORTRAN or similar programming backgrounds to join a rapidly expanding Systems House and Consultancy. Excellent careers are available in either development or support roles working with Banking Systems, Data Communications or Message Switching applications in London and abroad. An attractive salary range, reviewed at 6 monthly intervals is supplemented by a generous company benefits package. Ref. C3486

TARGA COMPUTER RECRUITMENT have gained an enviable reputation over the years for providing a speedy and efficient recruitment service to members of the Data Processing profession. Our client base is broad and the opportunities currently available cover the whole range from Junior Programmer upwards. People with particular 'City' skills such as Banking, Insurance or Broking are always in demand and if you are looking to change the direction of your career why not call us today for a frank informal discussion.

TARGA COMPUTER SERVICES
61 LIVERPOOL STREET 24-HOUR
LONDON EC2M 7NH ANSAPHONE
10 Lines 01-283 9941

Consultants Project Managers Project Leaders Programming Team/Leaders

£9,000-£16,000 + Car Scheme and Relocation

Hampshire

Our client, a fast expanding Systems House, wishes to recruit additional staff to create new teams and to expand existing teams developing large-scale Interactive Database Systems using the latest 32-bit technology.

Significant market penetration in both the U.K. and Europe has created challenging opportunities with substantial career potential for committed individuals able to demonstrate the commercial, technical and communications skills necessary to ensure success in a demanding environment.

Experience with a Software House, manufacturer or large user is essential and a background in the manufacturing and distribution sector an advantage. For the programming positions, a sound knowledge of COBOL is a pre-requisite.

To apply send your c.v. to Brian Postles.

Ferguson Thorley Bowles Associates Ltd.
International Personnel Consultants

15 Clarence Street, Staines, Middlesex. TW18 4BU Telephone: Staines (0784) 59247

CHIEF PROGRAMMER
Cobol/Basic - Commercial exp
to £12K
Lancashire

PROGRAMMERS
Cobol/Hewlett Packard/Applications exp
to £12K
Essex

SENIOR SYSTEMS ANALYSTS
Magnetic/Spice, Engineering Background, IBM exp.
to £25K
Oxford/Croydon

SALES EXECUTIVES
Packaging/Micros/Peripherals
to £14K
Bucks

SENIOR SYSTEMS ANALYSTS
Commercial Experience
to £15K
North Berks

PROGRAMMERS & ANALYSTS
Data General/Perkin Elmer/DEC
to £13K
London/Home Counties

TECHNICAL SUPPORT
to £14K
Bucks

SENIOR SYSTEMS PROGRAMMERS
DOS/CICS/Teleprocessing
to £13K
Nationwide

PROJECT MANAGER
Commercial Experience
to £13K
Surrey/London

FIELD SERVICE ENGINEERS
Mainframe/Minis/Peripherals
to £16K
Nationwide

ANALYST PROGRAMMER
Cobol/RPGS
to £12K
Herts/Manchester/Middlesex

SALES EXECUTIVE
Micro Exp.
to £20K
Surrey/Middlesex/London

SOFTWARE ENGINEERS
Fortran/Pascal
to £15K
North London

PROGRAMMERS
Cobol/Basic/Minis
to £29K
Leicestershire

CONSULTANTS
Banking/Insurance/Commodity Broking
to £13K
London

SENIOR PROJECT ENGINEER
Peripherals/Industrial contracts
to £15K
South France

PROGRAMMERS
Cobol/IBM 3031/Commercial exp.
to £15K
South France

PROGRAMMERS
Cobol/Commercial
to £15K
South France

PROGRAMMERS
Basic/++ RSTS/E

Sloangate
The Appointments Register

SLOANGATE LIMITED
24 KINGS ROAD
KINGS LINGHAM THAMES
SURREY KT2 5HX
TELEPHONE: 01-540 8234

WANTED

A DIRECTOR FOR THE COMPUTER CENTRE

Yarmouk University needs a Director for the Computer and Information Centre. Applicants should satisfy the following requirements:

1. To hold a Doctorate in Computer Science or Mathematics; otherwise, a Master's degree in Computer science or mathematics with practical experience in the field of Computers for a minimum period of 8 years.
2. Ability for planning, organizing, directing and follow up of Computer Work, with a good knowledge of system analysis, programming and operation and ability to develop the systems and methods of work in Computers.
3. Fluency in English and preferably in Arabic

Applications to be sent to Personnel Office, Yarmouk University Irbid, P.O. Box 566, Jordan, not later than the end of April, 1982.

YARMOUK UNIVERSITY

Sales Executives

SOUTH EAST
C£17,000 + 2.0 LITRE CAR
HIGH BASIC + G'TEE

Providing truly cost effective solutions requires a unique kind of follow through.

With computer-power, inconceivable 10 years ago, it has proved vital to have a marketing strategy which is sensitive to the needs of the end user and a programme of enhancement to suit their needs in the future.

The result is powerful but inherently flexible mini hardware, fully developed software and a support team both innovative and practical.

Combining these has accelerated the demand for the company's product and created opportunities for both the specialist and the generalist with either a commercial or technical/scientific background.

If you have a successful sales track record and the ability to manage and coordinate a high levels sales campaign, telephone: Steven Knowles-Baker on 01-584 1766/1767 or send a brief C.V. for his attention to the address below. Any approach will be treated in the strictest confidence.

**Michael Linford
Associates Ltd.**

Executive Search Consultants
45 Brompton Road, Knightsbridge, London SW3 6JT. Telephone 584 1766 1767.

IBM PROGRAMMERS

London PLI Neg to £9,000

A well-known commercial company seeks PLI programmers with 2 years' experience of commercial applications on IBM hardware, preferably using MVS.

The company have a wide variety of applications in their forward planning. In addition to the salary, they offer discounted SUPA, a season ticket loan, subsidised restaurant and £137 p.w. luncheon allowance.

PROGRAMMERS & ANALYSTS

London 1900 and 2900 to £10,500

A leading computing services company need programmers with at least 2 years' C/Cobol under DME and G.3 (or G.3 and G.2), salaries to £8,800. They also need analysts with 3 years' experience, preferably with a programming background and life assurance experience. Salaries to £10,500.

PROGRAMMER/ANALYSTS

London IBM Cobol - Banking to £9,000 + benefits

Programmer/Analysts are needed by an international banking organisation in London. 2 years' DOS Cobol is the minimum requirement, preferably with PLI and VSAM. Usual banking benefits include cheap mortgage after 6 months.

Babage

Computer Recruitment Limited
Lincoln Model House
32/34 Great Marlborough Street
London W1V 1HA
Telephone: 01-437 3942

SMR
Sales & Marketing Recruiters Ltd.
A Sales and Marketing Recruitment Company

SALESMEN
Exchange your job for a career

Would you like to help companies to make the most of their future productivity? Do you see the potential of the productivity of your own future?

A job is simply a task performed for a reward. A career might best be described as a whole for enabling the individual to exploit his strengths, overcome his weaknesses and grow towards his maximum potential. Unfortunately most sales people are in the latter category. If your job runs out of challenge, please remember that our consultants have more direct experience of computer sales and management than any other recruitment company. The skills to give individual career guidance, a reputation throughout the industry for professional competence and high ethical standards and an extensive portfolio of employment opportunities to suit most individual needs.

Sales and Marketing Recruiters - The Career Consultants!
Contact Alan Williams, Alexander Scott or Peter Hubble (0829)

LONDON & SOUTH
29 Oxford Street
London W1A 1AB
Tel: 01-636 7244

MIDLANDS & NORTH
24 Rose Street, Leicester
Leicester LE1 1JG
Tel: 0533 424444

SALES EXECUTIVE SOFTWARE TURNKEY SYSTEM SALES MANCHESTER

C.£20,000 PLUS COMPANY CAR

If you are as good at selling our software as we are at writing it... we would like to talk to you.

Wootton, Jeffreys & Partners are a PRIME based software and systems house with a reputation for some of the best commercial software in the business. We are looking to expand our commercial systems success to the Midlands and North and are looking for a mature and experienced Salesman to play a major role in this area.

To be based in our expanding Manchester office, the person appointed will be expected to sell an established and growing range of application packages, bespoke software to new clients, turnkey systems and bureau applications.

An exciting prospect in a fast growing organisation. Excellent remuneration package and top class working conditions.

Send a brief resume of career to date to: Dr. R. H. Williamson or call on 061-836 1898 for details.

WOOTTON, JEFFREYS & PARTNERS
12 ST. ANN'S SQUARE
MANCHESTER
M2 7HW

Victoria Appointments Ltd
FOR THE BEST PERMANENT AND CONTRACT JOBS IN THE NORTH OF ENGLAND

Victoria Appointments Ltd
24 Market Street, Manchester 2
Phone: 061-236 7319
(24 hr Answering Service)
Home: 061-464 8154

**DIRECTOR FOR
COMPUTER CAMP**

Computer Programmer/Compiler
Balance needed to direct
summer computer camp: 20th
June-7th August, LEYBURN, GWENT,
WALLES. French language de-
sirable. Tax-free salary plus trans-
portation, room and board. Must be
willing to work 12-16 hours per week.

Write or call:
VILLAGE CAMPS
235 CORPUS
SWITZERLAND
Tel: (4122) 762966

**BOX
NUMBERS**

Box number replies should be
submitted to:

Box Number.....
c/o Computer Weekly
Quadrant House
Sutton, Surrey SM2 5AS

TOP RATES

UNIVAC COBOL DMS/TP
VM, MVS, CICS, IMS - SYS PROG
BASIS DATABASE
DATABASE or COMMUNICATIONS SENIOR CONSULTANTS
(May, June, July, Starts
(Now)
(Now)
(Now)
(Now)

UTS 400 PROGRAMMER
UNIVAC 9870 COBOL IMS
OS/VS1 SYSTEMS PROGRAMMER
IBM/TSO/COBOL

MONTREAL ASSOCIATES SYSTEMS LTD
98/100 High Road
Ilford, Essex, IG1 1NS
01-553 2944 (4 lines) EMP Agy

**PUZZLE
ANSWER**

775
33 x
2325
2325
25575

SALES BIT Brief guide to Sodman'ship in the industry

GENERATING a new topic for Sales Bit is not the easiest thing I have to do every week, and I can think of nothing less conducive to fulfilling this task than to do so while suffering (as I am at the moment) from influenza on a wet and windy winter Wednesday (how's that for alliteration?).

So, I hope you will forgive me if I touch upon a frivolous topic which, despite its apparent lack of relevance to selling, will immediately be recognised by all those who have been baptised by total immersion into selling... Sod's Law.

Sod's Law has many derivations and manifestations, but fundamentally it is a distillation of many people's experience, and irrevocably confirms that if anything in day-to-day living can possibly go wrong, it will.

Indeed, this is only a beginning, for it is a well established fact that if there is a chance of several things going wrong, you can bet your life the one that will do the most damage is the one that gets up and hits you in the face.

Moreover, should you be smart enough to anticipate all such possibilities and take avoiding action, then a new and completely unforeseen event is sure to appear out of nowhere and get you where it hurts most; just when you're thinking how smart you are.

In fact, it is fair to say that in the context of Sod's Law, every solution generates a completely new problem. Remarkably, students of Sod's Law always manage to wear a smile, which is why true sales professionals always give the impression of being cheerful. This is because they know that things are bound to be worse tomorrow.

Having said all that, I would not claim for a moment that Sod's Law is the exclusive province of the salesman. Programmers in particular will be aware of the profound significance of this exact science in their everyday activities.

For instance, any truly experienced programmer will know only too well that the error located on page one of the source listing is only located by arriving at the last page having checked every line of code en route.

Moreover, when this error has been corrected, it will eventually be discovered that it was correct in the first place.

For such people Sod's Law really comes into its own when there is a major system breakdown or similar disaster, for it is a well established aspect of this philosophy that any genuine attempt to resolve an unmitigated mess will certainly make matters worse.

I have mentioned on more than one occasion in the past the need for adopting the right kind of attitude towards the achievement of sales success. All we disciples of Sod's Law know only too well that negative aspirations bring about negative rewards, whereas positive attitudes bring about positive results.

What is really true about it, Sod's Law has an influence upon most things. Why, it even affects many readers of Sales Bit. There is

Alan Williams

**PUZZLE
ANSWER**

775
33 x
2325
2325
25575